In re Application of
Ulrich Braun
Application No.: 09/890,113
Filed: July 26, 2001

PATENT
Attorney Docket No.: VOSS1170

Exhibit A

Replacement Sheets 1-2

APPLICANT(S): Ulrich Braun.
TITLE: METHOD AND DEVICE FOR SEPARATING AND DISPOSING OF FAECES AND URINE IN URINE SEPARATION TOILETS
Application No.: 09/890,113 File Date: January 7, 2002
Docket No.: VOSS1170

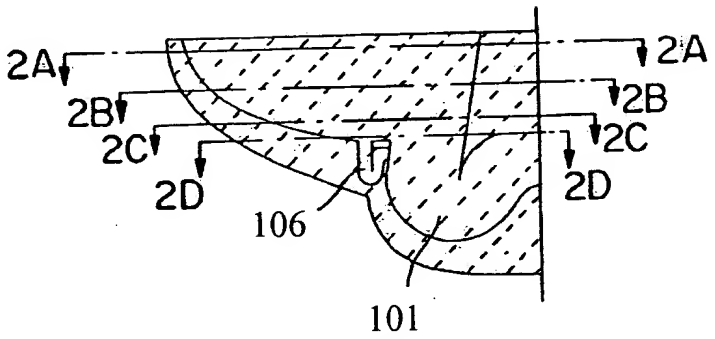

FIG. 1

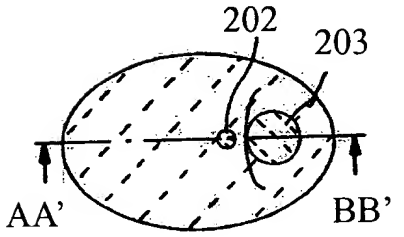

FIG. 2A

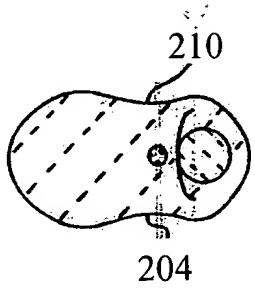

FIG. 2B

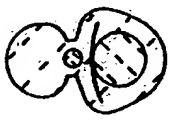

FIG. 2C

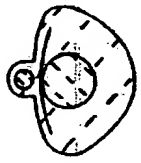

FIG. 2D

APPLICANT(S): Ulrich Braun.
TITLE: METHOD AND DEVICE FOR SEPARATING AND DISPOSING OF FAECES AND URINE IN URINE SEPARATION TOILETS
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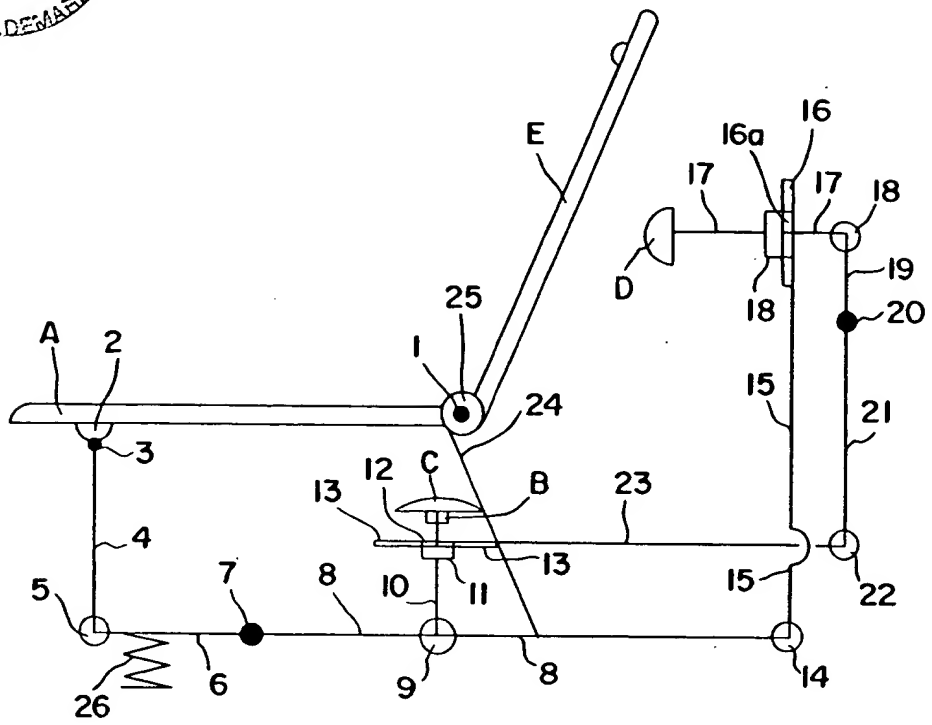


FIG. 3A

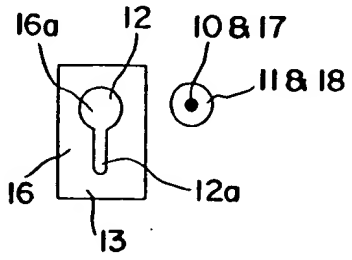


FIG. 3B

Exhibit B

Annotated Marked-Up Drawings

~~Fig. 3~~ Figure labeled as "FIG. 3A" and "FIG. 3B"

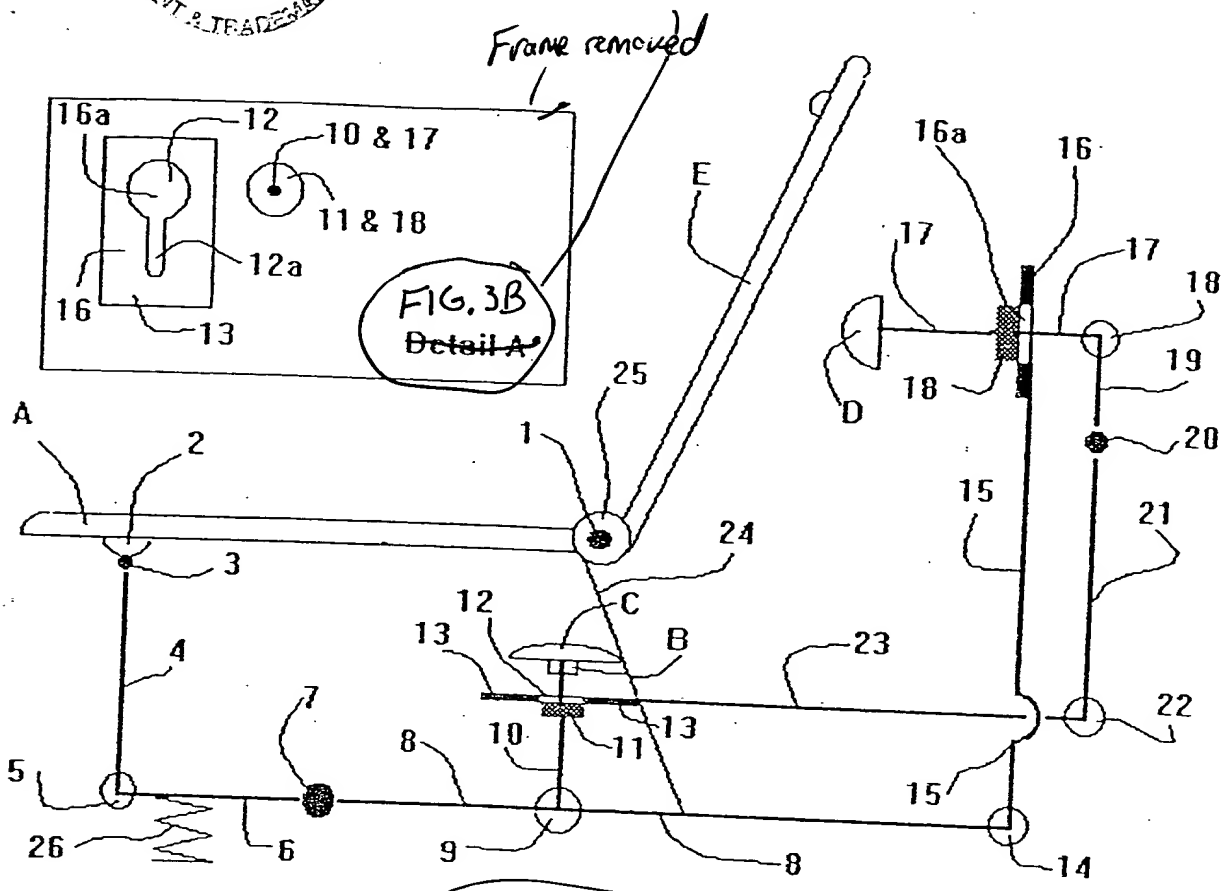
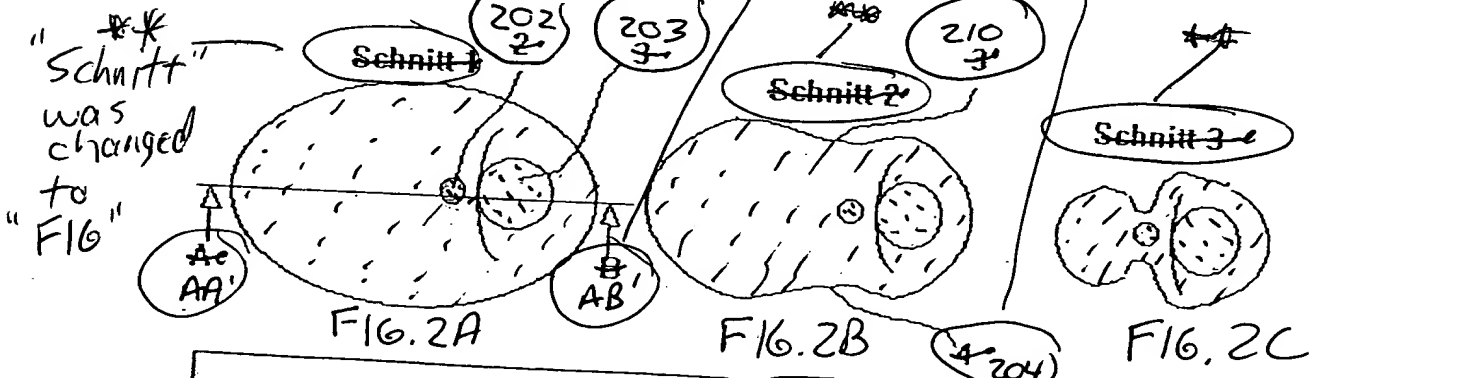
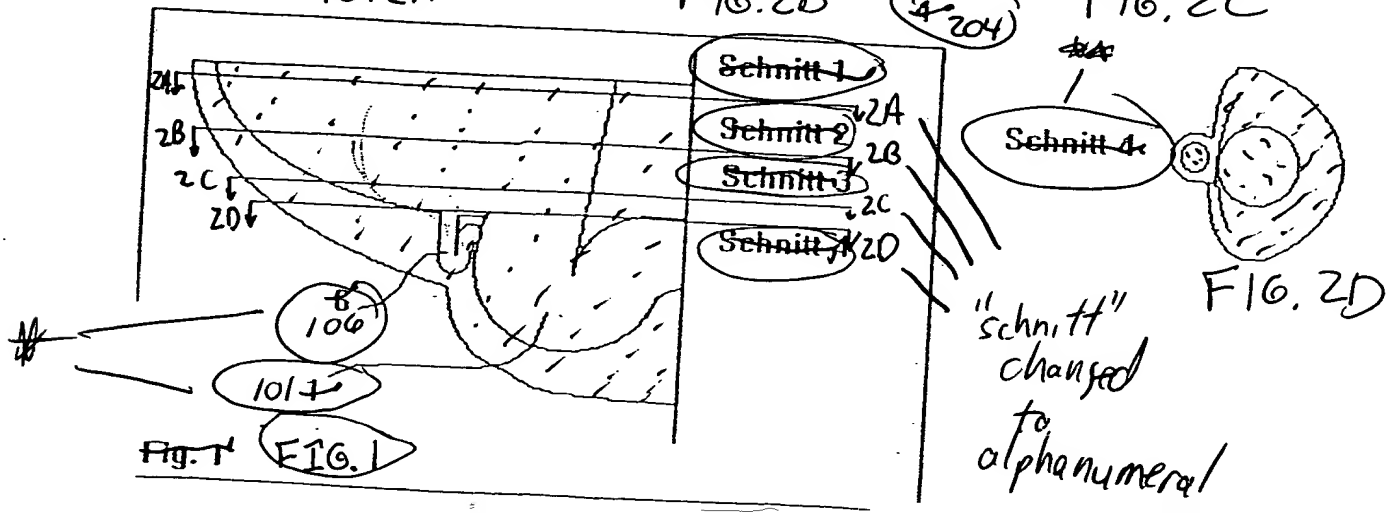


FIG. 3A

* Various element numbers were changed

~~Fig. 2~~



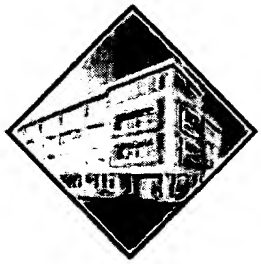


~~Fig. 1~~ FIG. 1

Exhibit C

Excerpts from http://www.roevac.de

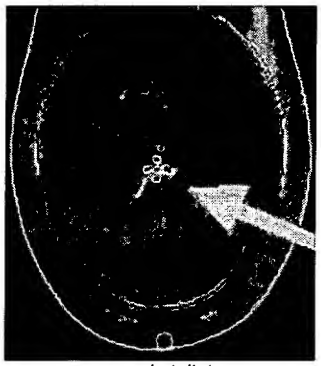
ROEDIGER
VAKUUM + HAUSTECHNIK



Welcome

Roediger VHT is a leading supplier of indoor and outdoor vacuum sewerage systems for the collection and transportation of domestic and industrial wastewater. Vaccum systems significantly reduce investment costs and/or operating expenses, as compared to conventional sewerage systems. Vacuum technology reduces water consumption considerably, enabling flexible installations regardless of topography. In addition, it allows for the use of alternative wastewater handling (black/gray water separation).

Roediger interface unit, valve and controller



no-mix toilet

- **Vacuum Sewerage Systems (outdoor sewage collection)**
  Economic solutions for the collection of waste waters from municipalities and industry
- **Vacuum Sanitary Systems (indoor sewage collection)**
  Water saving technology, vacuum toilets, interface units for all uses and multi-functional indoor applications
- **Evacuation of Sewage Tanks for Modes of Transportation**
  Quick, clean evacuation of toilet sewage from trains, ships, airplanes, and other applications
- **Hospital Decontamination Plants**
  Handling of radioactive wastewater from nuclear treatments
- **No Mix Toilets**
  Separation of Urine

Our Experience

More than 300 ROEVAC Systems in operation worldwide,
20 years of experience and innovation.

Product Scope and Services

Concept development, cost estimates, feasibility studies, delivery of components, installation of vacuum stations, individualized technical support and design assistance from our

Roediger Vakuum- und Haustechnik GmbH

Kinzigheimer Weg 104-106
D-63450 Hanau

Geschäftsführer:
Voler Kutschera, Dr. Volker Zang

Phone: +49-6181-309-275
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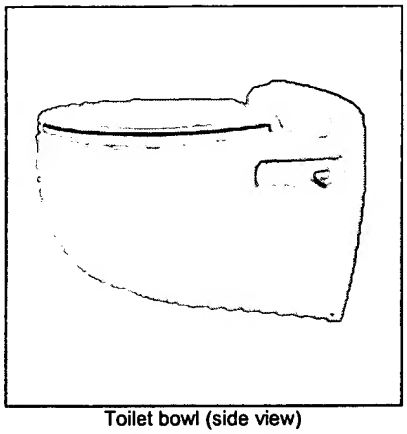
eMail: info@roevac.com

Amtsgericht Hanau HRB 6341

experienced engineers. UST-IDNr.: DE 812652600

Urine Separating Toil t

Range of Supply

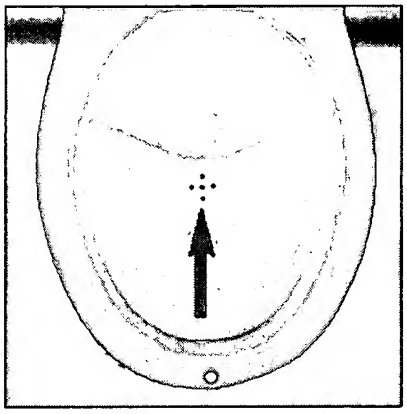


Toilet bowl (side view)

Ecological sanitation concepts require sophisticated toilets with such technical features as:

- Reduction of toilet flush water consumption
- Undiluted urine separation as a way to recycle human waste into agricultural fertiliser
- Comfort, easy handling and a modern design

Our drinking water is much too valuable to be misused for toilet flushing. Urine is a valuable fertiliser containing nutrients such as phosphate, nitrogen and potassium. Faeces can be combined with biological wastes for use in biological gas reactors.



Toilet bowl (arrow points to urine drain)

Many scientists and consultants demand closed circuits in wastewater management and sanitation. The ROEDIGER NO MIX TOILET fulfils all these demands.

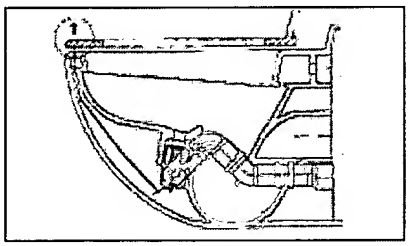
Functional principle

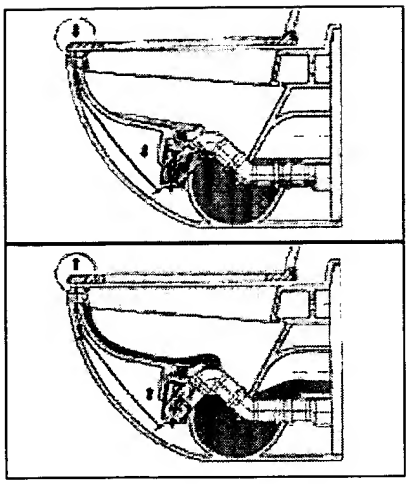
The ROEDIGER NO MIX TOILET looks, and can be used, like a conventional modern toilet, with the exception that men have to sit during use. The toilet has two separate outlets: a conventional outlet for faeces and pa-per located in the back part of the bowl, and an outlet for urine, which is closed by a movable plug. While the toilet seat is in use, the plug is mechanically opened by a lever. Urine flows to the front inlet. Standing up closes the plug again. The two parts of the toilet bowl are not separated by a barricade. As soon as the toilet is flushed, the plug closes. Only as needed would faeces and paper be washed away with minimal amounts of wa-ter through the rear outlet.

Urine is taken away undiluted.

Idle

Outlet for urine drainage is closed by a movable plug





In Use

While the toilet is in use (person sitting), the plug is mechanically opened by a lever. Urine flows to the front inlet.

Flushing

After the user is getting up, the toilet can be flushed. While the plug for the urine outlet is closed, faeces and paper can be flushed out with minimal amounts of water through the rear outlet.

To obtain further information

order further information

· NO MIX TOILET ROEDIGER's S parating Toil t

Range of Supply

Urine Separating Toilet

In case of solid waste it is already a matter-of-course to separate the different kinds of waste from each other, either with delivery- and discharge-services, with yellow bags or blue barrels. Now we also separate the "fluid waste" from household: the sewage! We separate urine from faeces! With one single toilet - the ROEDIGER *NO MIX toilet!*

Why? For what purpose? What is that good for?

Urine is a precious raw material !

- Urine contains **nitrogen** and **phosphorus**. The exploitable reserves of phosphate are step by step running low world-wide. On the other hand urine contains enormous amounts of phosphate salts in such concentrations that even **industry** is interested in this "raw material" in order to produce clearest products. Likewise nitrogen and urea can be recycled easily.
- Urine can be used as a valuable **plant nutrient** as well as fertiliser for agriculture.
- Treatment plants are nowadays often overcharged. Wastewater is treated and cleansed from contaminations and impurifications by means of high energy- and cost-expenses. The separation of sewage can **relieve the treatment plants** considerably. In Switzerland the EAWAG is already elaborating first concepts. So why should they continue diluting harmful material contents several 100 times in gravity sewerage plants and continue mixing them, and afterwards removing these noxious particles with enormous efforts?
- In **hospitals** are often prescribed or given medicaments whose degradation products are again excreted via the human organism. Those are a considerable burden and contamination for environment. These degradation products are mainly contained in urine. This urine can be collected selectively by means of the ROEDIGER *NO MIX TOILET* and can so be treated separately.
- Last but not least by means of the ROEDIGER *NO MIX TOILET* considerable quantities of **flushing water can be saved**. Because due to the separate outlet a special flushing with high amounts of water is not needed.

ROEDIGER has been animated by several research institutes to develop a toilet with modern design which **separates urine undilutedly** and which can be used like a "normal" toilet. We are now proud to expose this patented *NO-MIX TOILET* at the ISH. When one is sitting down on the toilet seat the valve of the urine outlet opens automatically. Then the urine flows out via the aperture in front. After using the toilet the valve is closed. If necessary the other contaminating particles and paper via the normal siphon in the rear part. The collected urine, which does not stink **without water dilution** can be collected in separate recipients and so be reused. All over Europe the first pilot projects are being prepared.

For any further informati n about the ROEDIGER *NO MIX TOILET* please contact:

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mail: vhtklu@roediger-hu.de

order further information

Exhibit D

U.S. Pat. No. 3,336,602

Aug. 22, 1967 T. T. KUBIT 3,336,602

FLUSH TANK TOILET

Filed Feb. 5, 1965 2 Sheets-Sheet 1

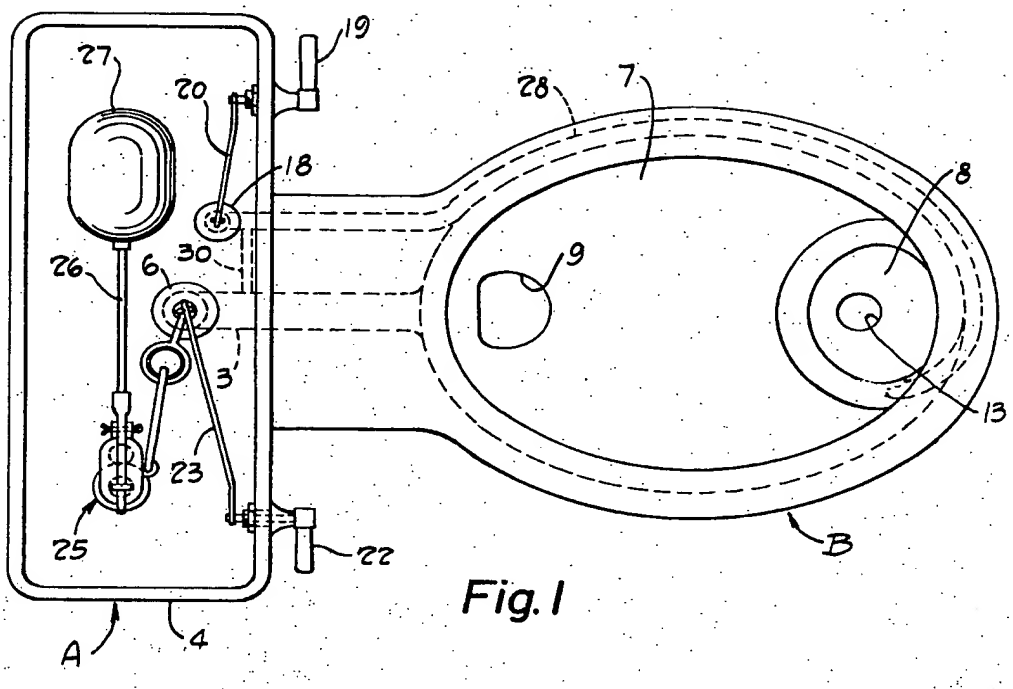

Fig. 1

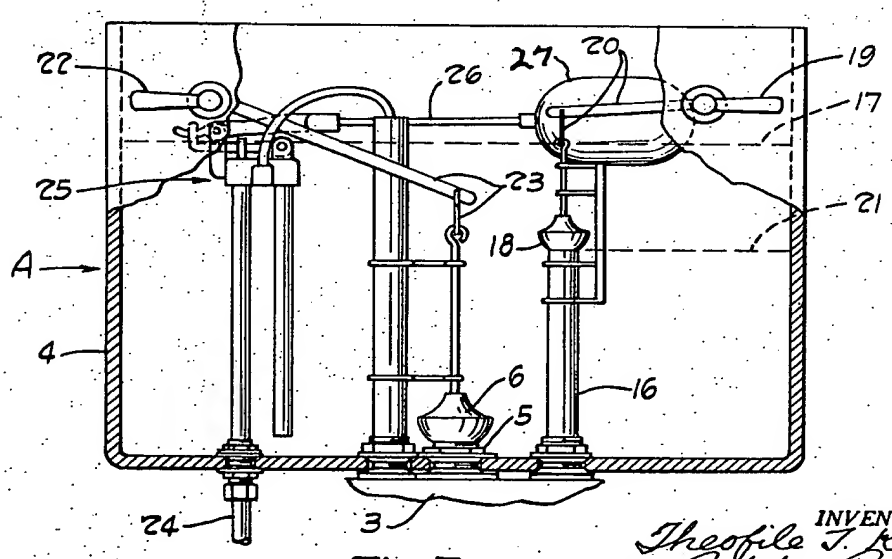

Fig. 3

INVENTOR.
Theofile T. Kubit
BY Robb & Robb
Attorneys.

Aug. 22, 1967 T. T. KUBIT 3,336,602

FLUSH TANK TOILET

Filed Feb. 5, 1965 2 Sheets-Sheet 2

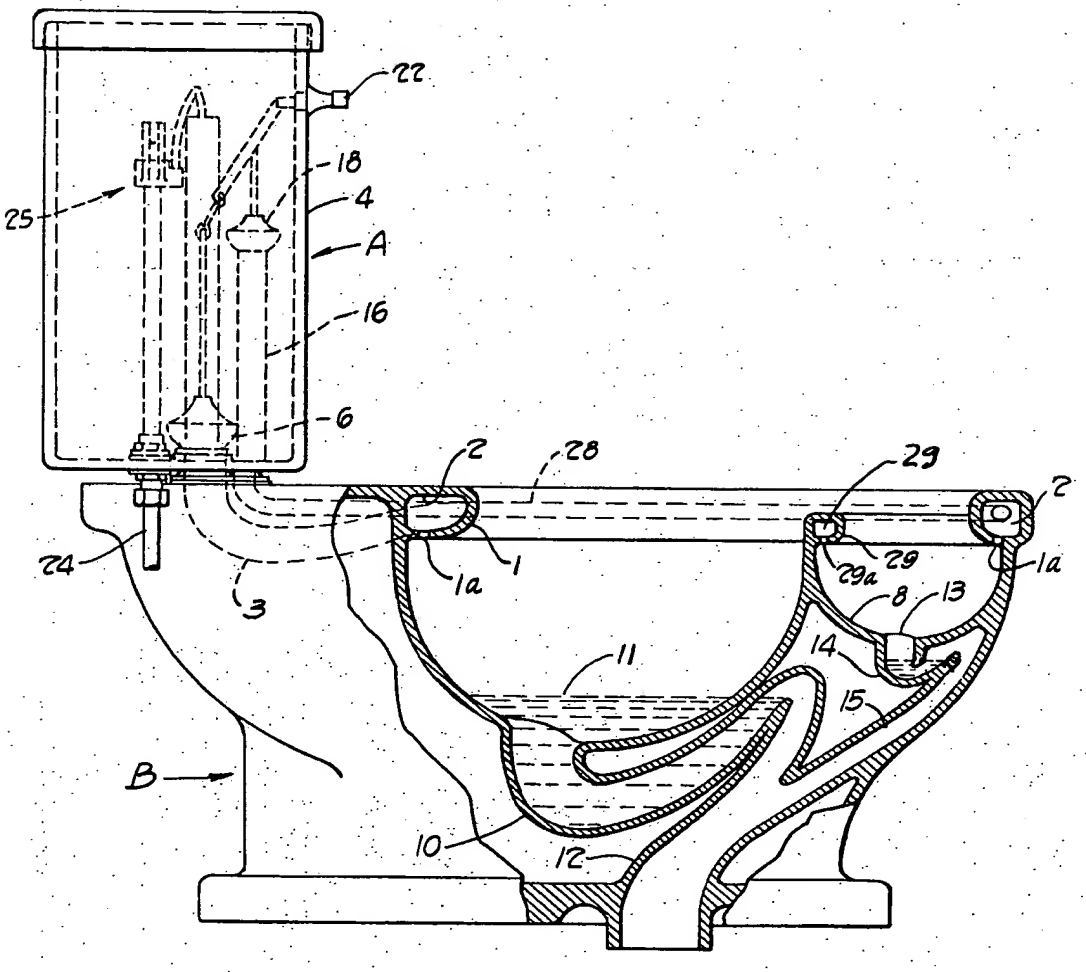

Fig. 2

INVENTOR.
Theofil T. Kubit
BY Robb & Robb
Attorneys.

United States Patent Office 3,336,602
Patented Aug. 22, 1967

3,336,602

FLUSH TANK TOILET

Theofile T. Kubit, 7430 Meadow Lane Drive, Cleveland, Ohio 44134

Filed Feb. 5, 1965, Ser. No. 430,622
9 Claims. (Cl. 4—97)

This invention relates to flush tank toilets and more particularly aims to provide such a toilet having a separate urinal bowl adjacent the main bowl, and means for separately flushing the urinal bowl and the main bowl.

The flushing of a tank type toilet such as commonly used in residences and other places requires the utilization of five gallons or more of water for each flushing operation. Since in the majority of instances the toilet is used merely for urination and not for disposition of fecal matter, it would seem that the utilization of such a large quantity of water for each flushing in cases where the bowl has been employed for urination only, constitutes not only a waste of water but a large expenditure for the utilization of such quantity of water which could possibly be minimized.

With the foregoing in mind it is a principal object of my invention to provide such a flush type toilet in which a much smaller quantity of water may be utilized for flushing in those instances where the toilet has been used for urination only.

A further object of the invention is to provide a flush tank toilet of generally conventional type which is capable of being used for all usual purposes and which is provided with a separate urinal section within the main bowl section and is further provided with separately controlled means for selectively flushing either the urinal section only or both the urinal section and the main bowl section at the same time.

My present invention, therefore, contemplates the provision of a toilet comprising a flush tank and a bowl section having a main bowl, a urinal bowl adjacent the main bowl, and means for selectively flushing and separately flushing either the urinal bowl only or both the urinal bowl and main bowl at one time and by the utilization of a single flush tank of generally conventional type. For the latter purpose, my invention contemplates the provision of conventional outlet means at the bottom of the flush tank communicating with the main bowl for flushing the same in a generally conventional manner. My invention further provides however, a second outlet means from the flush tank at a higher level than the first outlet means, the said second outlet means communicating with said urinal bowl for flushing the same, and a separate valve means for controlling outflow of liquid from the said second outlet means of the flush tank. The separate valve means for controlling the outflow of liquid to flush the main bowl and to flush the urinal bowl are each of the same generally conventional type.

For the purposes of flushing both the urinal bowl section and the main bowl section at the same time, means is provided for conducting liquid from the bottom tank outlet to both the main bowl and the urinal bowl section.

A further advantage arising from the use of my invention is that the urinal bowl section is normally dry and hence quieter in use for urination than is the main bowl for the same purpose since the latter contains a quantity of water therein.

Other features, advantages and objects of the invention will become apparent from the following detailed description taken in conjunction with the acocmpanying drawing, in which:

FIGURE 1 is a top plan view of a flush tank toilet embodying my invention.

FIGURE 2 is a sectional view taken about on the line 2—2 of FIGURE 1.

FIGURE 3 is an elevational view of the flush tank, portions being shown in section.

Now referring to the drawing and describing the invention in detail, the letter A generally designates the flush tank section and the letter B generally denotes the bowl section of a toilet, both sections being of generally conventional design of flush tank type toilets commonly used in residences and elsewhere. The upper rim of the bowl section B is of conventional channel form providing a conduit for liquid and extending all the way around the periphery of the upper rim thereof. The said channel formation, denoted by the numeral 1, is disposed inwardly of the bowl section around the upper periphery thereof providing a conduit 2 therewithin which is in communication with the main outlet pipe 3 in communication with the discharge opening at the bottom of the flush tank 4. Said discharge opening is provided with the usual valve seat 5 and is adapted for seating engagement thereon of a conventional rubber valve member 6. The lower extremity of the channel formation 1 is provided with a plurality of apertures 1*a* adjacent the interior bowl surface so as to permit liquid to be carried around the conduit 2 and also to flow out through the apertures 1*a* and thereby flush down the sides of the bowl in the usual manner when the valve member 6 is lifted from its seat to permit discharge of liquid from the flush tank 4 through the outlet pipe 3.

The bowl section B provides a main bowl 7 and a separate urinal bowl 8 somewhat smaller than the main bowl and disposed within the latter at the forward portion of the bowl section B.

The said main bowl 7 is provided with the usual discharge opening 9 in the lower portion thereof which communicates with the conventional siphon trap 10 which serves to maintain a normal liquid level represented by the dotted line 11 within the main bowl 7, the liquid in the bowl 7 and trap 10 being discharged therefrom to and outwardly through the discharge pipe 12 by siphon action through the trap 10 during the flushing operation of the main bowl.

The urinal bowl 8 is similarly provided with a discharge opening 13 likewise communicating with a siphon trap 14 which in turn communicates with a branch discharge pipe 15 leading into and communicating with the main discharge pipe 12. The siphon trap 14 is preferably designed to maintain a normal liquid level therewithin, which normal liquid level is, however, lower than the urinal bowl 8 so that no liquid is retained in the urinal bowl. The liquid retained in the siphon trap 14 is of course discharged therefrom through the discharge pipes 15 and 12 by a siphon action in the operation of flushing the urinal bowl 8.

Means for separately flushing the urinal bowl 8 without flushing the main bowl 7 is provided and this means includes a second outlet pipe 16 extending through the bottom of the flush tank 4 and upwardly therewithin so that its upper extremity is higher than the seat 5 of the discharge pipe 3 and somewhat below the normal liquid level represented by the dotted line 17 normally maintained within the flush tank 4.

The upper extremity of the discharge pipe 16 is provided with a valve seat similar to the valve seat 5 for seating engagement with a conventional rubber valve member 18 which may be actuated in the usual manner by means of a lever 19, which is connected through linkage generally indicated by the numeral 20 with the valve member 18 in a manner such that actuation of the lever 19 will serve to lift the valve member 18 from its seat to permit discharge of liquid from the flush tank 4

through the discharge pipe 16 until the liquid level is lowered to the level of the upper extremity of the discharge pipe 16, which latter level is represented by the dotted line 21 at which time the floating connection of the valve member 18 with its linkage 20 permits the valve member 18 to re-seat itself upon the seat at the upper extremity of the discharge pipe 16.

The valve member 18 and its actuating means is thus similar in design and operation to the corresponding conventional means for actuating the valve member 6 which similarly comprises an operating lever 22 located on the exterior of the flush tank 4 and connected through operating linkages generally designated 23 with the valve member 6.

Water is supplied to the flush tank 4 by means of the supply pipe 24 extending into the flush tank 4 and controlled by a conventional ball cock 25 which is actuated by a lever 26 having at its outer end a ball float 27 which floats in the liquid in the flush tank 4, rises with the rising liquid level in the tank 4 and shuts off the flow of water from the supply pipe into the flush tank 4 when the liquid level therein reaches the normal level represented by the numeral 17.

The discharge pipe 16 communicates with a pipe or conduit 28 which may pass around a portion of the upper part of the bowl section B so as to discharge into the urinal bowl 8 for flushing the same. For this purpose, the pipe 28 may be disposed within a portion of the channel section 1 or at some other location within the confines of the bowl section B. The urinal bowl 8 may have its upper rim provided with a channel formation 29 similar to the channel formation 1 and extending around the upper periphery of the urinal bowl 8 so as to provide a conduit for liquid around the upper portion of the bowl, the channel formation 29 being provided with a plurality of apertures 29*a* adjacent the interior surface of the urinal bowl 8 so as to permit liquid to be conducted around the conduit 29*b* provided by the channel formation 29 and also flow out through the apertures 29*a* and flush down the sides of the bowl in a manner similar to that described with reference to the main bowl 7. As will be understood, the conduit 28 discharges into the conduit 29*b* provided by the channel formation 29.

In operation, whenever the urinal bowl 8 has been used for urination, this bowl may be flushed by actuation of the lever 19 to raise the valve member 18 from its seat and permit discharge of liquid from the flush tank through the discharge pipe 16 until the liquid level in the tank 4 lowers from the normal level 17 to the level 21 at which time the valve member 18 will re-seat itself on its seat at the upper extremity of the discharge pipe 16 and the ball float 27 having lowered to the lower level of the water in the flush tank represented by the numeral 21 serves to open the ball cock 25 for inflow of water from the supply line 24 into the flush tank 4 to again raise the level of liquid therein to the normal level represented by the line 17.

Thus it will be apparent that when urinal bowl 8 is separately flushed in the manner above described, there is utilized for this purpose only a relatively small quantity of water represented by the difference in liquid level between the lines 17 and 21.

It will be apparent of course that when it is desired to flush the main bowl 7, this will be accomplished by actuation of the lever 22 in the usual manner to displace the valve 6 from its seat until the liquid in the flush tank is almost completely discharged through the discharge pipe 3 whereafter the valve member 6 will re-seat itself on its seat 5 and the ball cock 25 will automatically operate to restore the liquid level in the tank 4 to the normal level 17. A small pipe or conduit 30 is provided for communication between the discharge pipe 3 and the discharge pipe 16 so that when the lever 22 is actuated to flush the main bowl 7 a small portion of the liquid in the tank 4 is diverted through the pipe 30 to the conduit 28 for simultaneously flushing the urinal bowl 8, the conduit 30 being of much smaller diameter than the discharge pipe 3 so as to divert only a relatively small quantity of water for the flushing of the urinal bowl.

It will be apparent from the foregoing that my invention in providing a separate urinal bowl within the main bowl of a conventional toilet and in providing means for flushing the urinal bowl by the utilization of a small quantity of water from the conventional flush tank, serves to greatly economize on the use of water for purposes of flushing the toilet after urination and provides for quietness of operation among other advantages.

I claim:

1. A toilet comprising a flush tank and a bowl section, said bowl section having a main bowl and a urinal bowl adjacent said main bowl, said flush tank including means for controlling in flow of liquid thereto to normally maintain the liquid level therein at a predetermined high level, first outlet means from said flush tank at the bottom thereof and communicating with said main bowl for flushing the same upon outflow of liquid through said first outlet means, valve means for controlling outflow of liquid through said first outlet means, second outlet means from said tank at a higher level than said first outlet means, said second outlet means communicating with said urinal bowl for flushing the same upon outflow of liquid through said second outlet means, and second valve means for controlling outflow of liquid from said second outlet means.

2. A toilet comprising a flush tank, a main bowl, a urinal bowl within said main bowl, said flush tank including means for controlling inflow of liquid thereto to normally maintain the liquid level therein at a predetermined high level, first outlet means from said tank at the bottom thereof and communicating with said main bowl for flushing the same upon outflow of liquid through said first outlet means, valve means for controlling flow of liquid from said first outlet means, second outlet means from said tank at a higher level than said first outlet means, said second outlet means communicating with said urinal bowl for flushing the same upon outflow of liquid through said second outlet means, and second valve means for controlling flow of liquid from said second outlet means.

3. A toilet as in claim 1, wherein said main bowl has a fluid conduit of channel form extending around the upper rim thereof, said fluid conduit communicating with said first outlet means, and fluid conduit means communicating with said second outlet means and with said urinal bowl, said latter conduit means extending through a portion of the first mentioned conduit means.

4. A toilet as in claim 1, wherein said main bowl has a fluid conduit of channel form extending around the upper rim thereof, said fluid conduit communicating with said first outlet means, said urinal bowl has second fluid conduit means of channel form extending around the upper rim thereof, and third fluid conduit means communicating with said second outlet means and with said second fluid conduit means, said third fluid conduit means extending through a portion of the first mentioned fluid conduit means.

5. A toilet as in claim 1, wherein said urinal bowl has a discharge opening therein, a siphon trap communicating therewith, said siphon trap being adapted to maintain a liquid level therein below the level of said discharge opening.

6. A toilet as in claim 1 wherein said second outlet means comprises a discharge pipe extending through the bottom of said flush tank upwardly therewithin to a level below said predetermined high level.

7. A toilet as in claim 6, wherein said main bowl has a fluid conduit of channel form extending around the upper rim thereof, said fluid conduit communicating with said first outlet means, and fluid conduit means com-

municating with said second outlet means and with said urinal bowl, said latter conduit means extending through a portion of the first mentioned conduit means.

8. A toilet as in claim 6, wherein said main bowl has a fluid conduit of channel form extending around the upper rim thereof, said conduit communicating with said first outlet means, said urinal bowl has second fluid conduit means of channel form extending around the upper rim thereof, and third fluid conduit means communicating with said second outlet means and with said second fluid conduit means, said third fluid conduit means extending through a portion of the first mentioned fluid conduit means.

9. A toilet as in claim 6, wherein said main bowl has a fluid conduit of channel form extending around the upper rim thereof, said conduit communicating with said first outlet means, said urinal bowl has second fluid conduit means of channel form extending around the upper rim thereof, and third fluid conduit means communicating with said second outlet means and with said second

fluid conduit means, said third fluid conduit means extending through a portion of the first mentioned fluid conduit means and wherein said urinal bowl has a discharge opening therein, a siphon trap communicating therewith, said siphon trap being adapted to maintain a liquid level therein below the level of said discharge opening.

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LAVERNE D. GEIGER, *Primary Examiner.*

H. K. ARTIS, *Assistant Examiner.*

Exhibit E

U.S. Pat. No. 5,873,136

US005873136A

United States Patent [19]

Geeham

[11] Patent Number: 5,873,136

[45] Date of Patent: Feb. 23, 1999

[54] **POP-UP BOWL VALVE FOR TOILET WITH TWO FLUSH MODALITIES**

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[52] **U.S. Cl.** **4/434**; 4/252.5; 4/324; 4/326; 4/363; 4/364; 4/405; 4/411; 4/413; 4/684

[58] **Field of Search** 4/249, 252.4, 252.5, 4/324, 325, 326, 363, 364, 405, 406, 411, 412, 413, 414, 434, 441, 442, 684, 287, 293, 471, 650, 682

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Conventional Toilet Drain Connector—Undated but on Market for Many Years.

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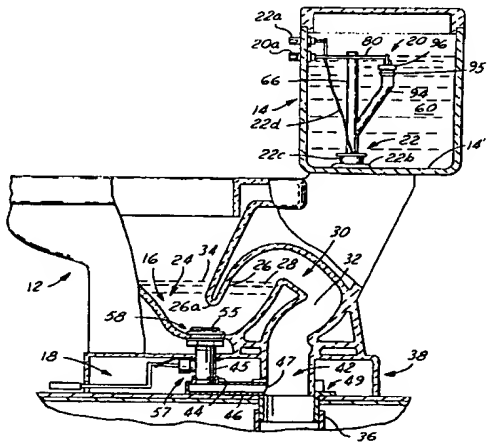
[57] **ABSTRACT**

A two flush modality toilet composed of a bowl, a tank connected with the bowl wherein the tank is connected to a water supply, a conventional flush modality for flushing solid waste from the bowl, and a urinal flush modality for flushing liquid only waste from the bowl, wherein the urinal flush modality includes: a bowl valve in the form of a pop-up stopper, pop-up seat and pivot ball assembly at the low point of the bowl; a bowl valve control for selecting between open and closed states of the bowl valve, a passageway for directing liquid waste from the bowl into the sanitary drain; and an auxiliary flush control for supplying a limited quantity of flush water from the tank into the bowl to provide restoration of the trap water in the bowl after a urinal flush modality liquid drainage of the bowl has occurred. A foot pedal selectively operates the bowl valve, wherein when in an open state all the liquid in the bowl is drained. Upon release of the foot pedal, the bowl valve is returned to the closed state. A limited amount of flush water from the tank is then delivered to the bowl to restore the trap water.

14 Claims, 3 Drawing Sheets



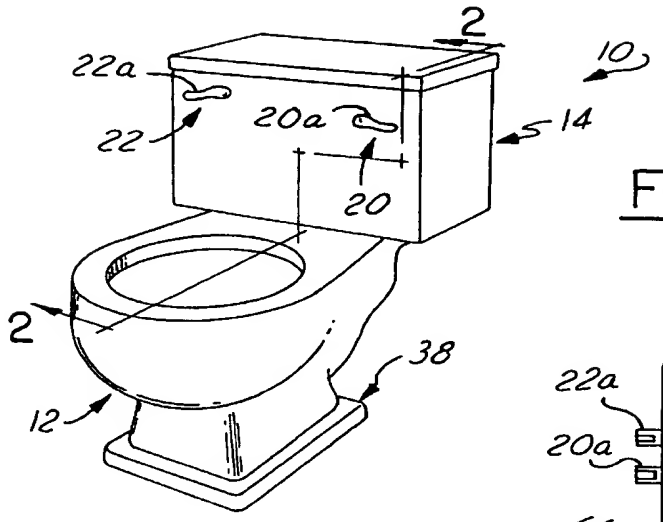
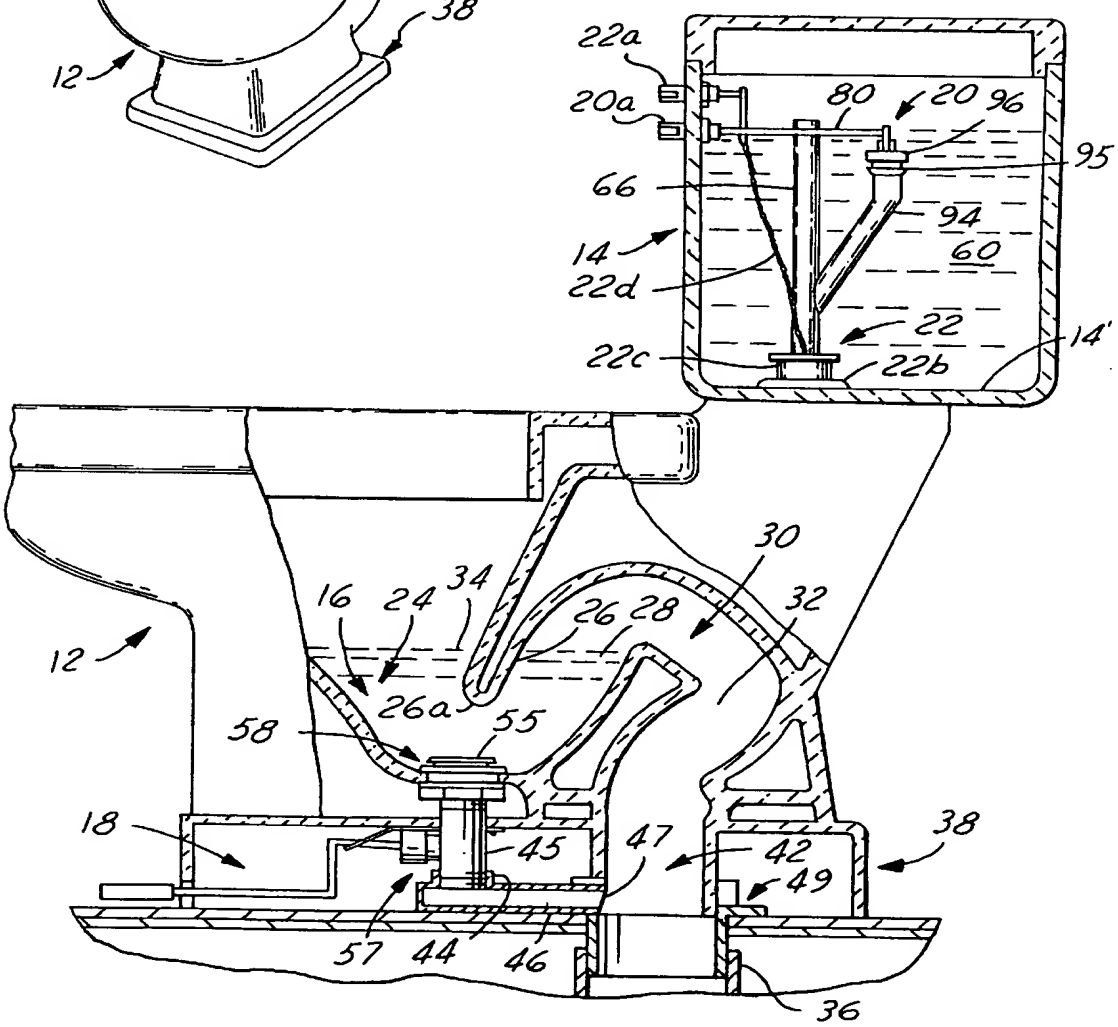

2
10
22a
22
20a
14
20
2
38
12

FIG. 1


22a
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95
66
94
14
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22d
22
14'
22c
22b
30
16
24
34
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26a
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18
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42
38
49
57
44
46
36

FIG. 2

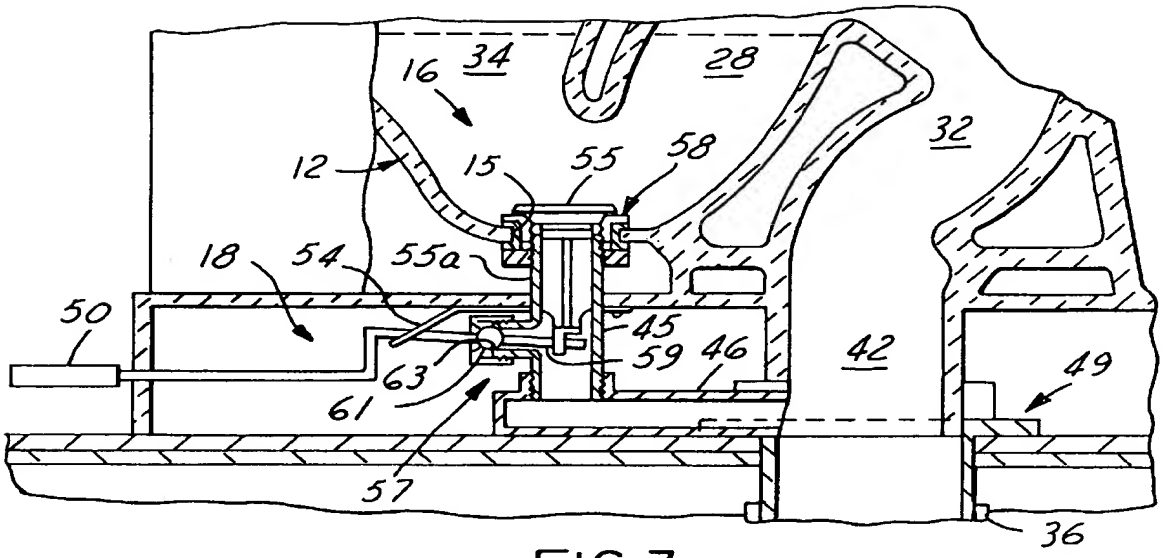

FIG. 3

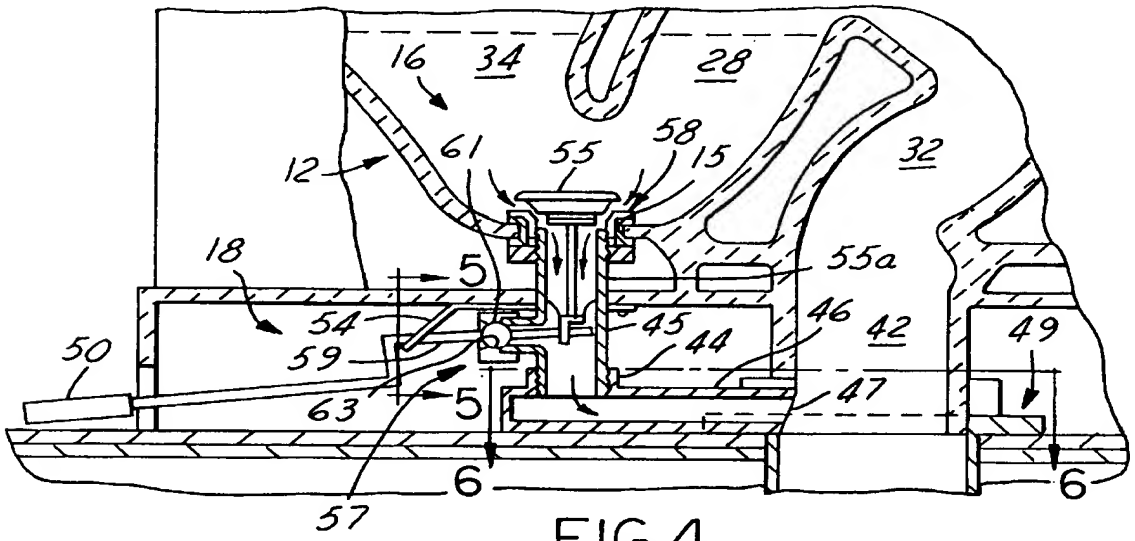

FIG. 4

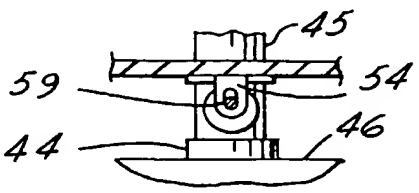

FIG. 5

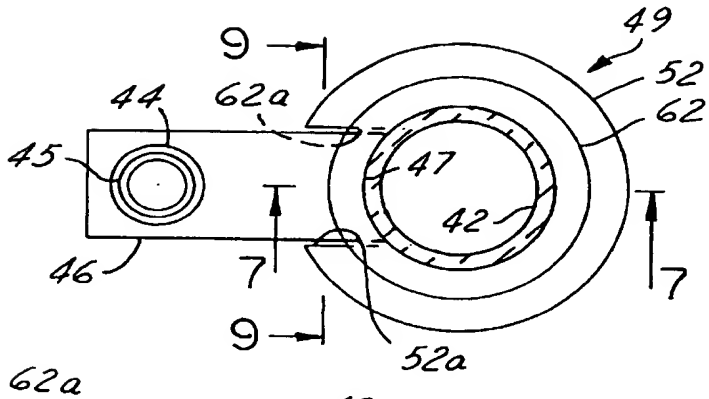

FIG.6

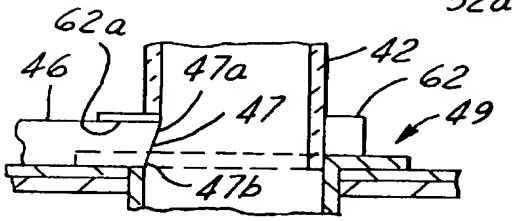

FIG.7

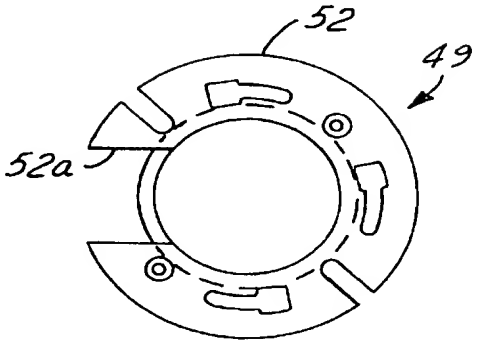

FIG.8

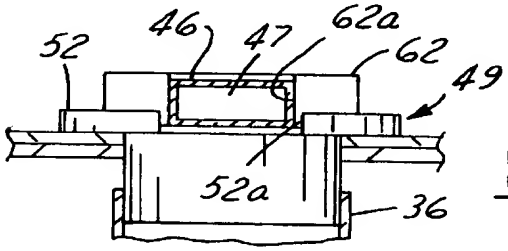

FIG.9

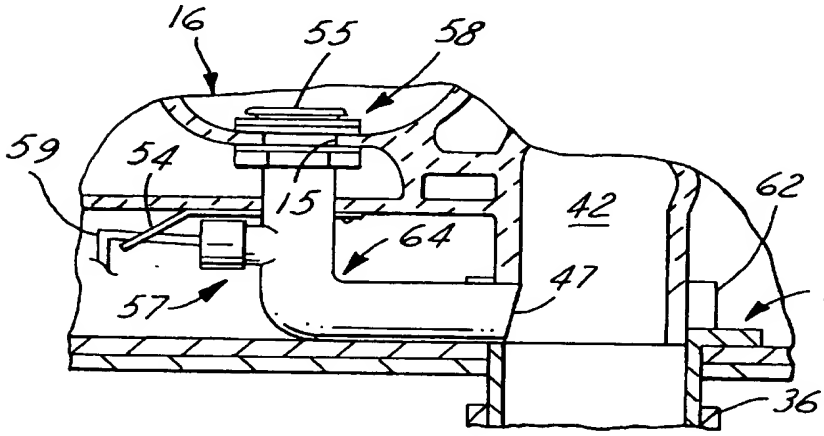

FIG.10

POP-UP BOWL VALVE FOR TOILET WITH TWO FLUSH MODALITIES

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to toilets having two flush modalities, wherein one flush modality is a urinal flush modality. More particularly, the present invention relates to a bowl valve for the urinal flush modality in the form of a pop-up valve. Still more particularly, the present invention relates to a toilet having two-flush modalities wherein urinal flush piping has a minimized cross-sectional height.

2. Description of the Prior Art

Toilets serve admirably as an efficient and sanitary means to dispose of waste material. Toilets operate upon a flush cycle, wherein waste disposal is performed with the accompaniment of a large quantity of water, usually on the order of three, four or more gallons.

As population densities have increased, the demands upon available water supplies have become quite substantial. Indeed, periodically, certain locales are subject to water rationing, wherein flushing of the toilet is requested to be performed only infrequently. Such a request not only subjects the toilet user to odor, but potentially also to disease due to the stagnancy of pre-used bowl water. Accordingly, a solution to the water demands of toilet flushing with each toilet use would be extremely desirable for both personal and ecological reasons.

One "popular" notion to reduce the amount of f lush water needed is to place an object in the tank, such as a water filled plastic milk container, the volume of which diminishing the water volume in the tank. While this sounds not only feasible but practical, one must consider why, in the first place, the toilet manufacturer designed the tank to hold a specified amount of flush water. First, there must be enough flush water to move solid waste in the bowl out of the toilet and into the sanitary drain. Second, there must be still more flush water to flush out the dirty bowl water while at the same time rinsing the bowl clean. Thirdly, there must be enough flush water left over to provide an adequate depth of water at the trap located at the bottom portion of the bowl so that the sanitary drain is fluidicaily cut-off from the bowl to thereby prevent methane and other sewer gases from backing-up into the bowl, and, thereupon, into the restroom. Thus, reducing the amount of flush water by simply reducing the water stored in the tank may result in insufficient water to properly flush the bowl. More potentially disastrous, is that over time an accumulation of solid waste may become lodged in the sanitary drain, plugging the drain and resulting in back-ups because repeatedly too little flush water was available to move the solid waste out the local sanitary drain and into the main sanitary drain.

Some toilets operate on a flush process wherein less flush water is required, such as described in U.S. Pat. No. 4,987,616 to Ament, dated Jan. 29, 1991. Other toilets combine a lesser amount of flush water in combination with a compressed gas principle. Problematically, these toilets may be subject to drain clogging if insufficient flush water is available to move the flushed solid waste out into the main sanitary drain.

The flushing of liquid waste requires less flush water than does the flushing of solid waste, since the flushing of liquid waste does not entail the potential for drain clogging. With this concept in mind, the present inventor devised a toilet with two flush modalities, now described in U.S. Pat. No. 5,548,850, issued on Aug. 27, 1996, which patent is hereby herein incorporated by reference, wherein described is a toilet which operates on the basis of two flush modalities: one for flushing solid waste, and a second for flushing only liquid waste.

The two flush modality toilet according to U.S. Pat No. 5,548,850 is composed of a bowl, a tank connected with the bowl wherein the tank is connected to a water supply, a conventional flush modality for flushing solid waste from the bowl, and a urinal flush modality for flushing liquid only waste from the bowl, wherein the urinal flush modality includes: a bowl valve at the base of the bowl, a bowl valve control for selecting between open and closed states of the bowl valve, a conduit for directing liquid waste from the bowl into the sanitary drain, and an auxiliary flush control for supplying a limited quantity of flush water from the tank into the bowl to provide restoration of the trap water in the bowl after a urinal flush modality has been initiated.

A foot pedal selectively operates the bowl valve, wherein when in an open state all the liquid in the bowl is drained. Upon release of the foot pedal, the bowl valve is returned to a closed state. Flush water from the tank is then delivered to the bowl to restore the trap water.

Operation may be mechanically effected or electronically effected. With regard to mechanical operation, the flush water from the tank may be introduced by action of the foot pedal or by separate action of a control at the tank.

While the above described two flush modality toilet is admirably able to do the job intended, there is improvement needed. For example, the bowl valve described therein is in the form of a bowl stopper which sealingly engages a bowl valve seat, wherein the bowl valve is opened by moving the bowl stopper descendingly away from the bowl and the bowl seat. As a result, sealing may not be assured, in that the weight of the water in the toilet bowl presses down on the bowl stopper, tending to unseal it in relation to the bowl seat. Further, the cross-sectional height of the plumbing associated with the urinal flush modality as described therein is potentially too large to be truly practical.

Accordingly, what is needed is a two flush modality toilet wherein the bowl valve is simple and reliable and the urinal flush plumbing has minimal cross-sectional height.

SUMMARY OF THE INVENTION

The present invention is a two flush modality toilet wherein the bowl valve is simple and reliable and the urinal flush plumbing has minimal cross-sectional height.

The bowl valve according to the present invention is in the form of a pop-up valve wherein a pop-up stopper sealingly rests upon a pop-up seat to close the bowl valve, and wherein the pop-up stopper raises in relation to the pop-up seat to open the bowl valve. The associated linkage between the pop-up stopper and a foot pedal is structured to provide a minimized vertical cross-sectional height.

The plumbing associated with the urinal flush modality, including the pop-up valve body, passageway and drain connection thereof have a minimized vertical cross-sectional height. In this regard, the flange of the floor drain connector is preferred to be slotted at the entry of the interconnection of the passageway and the drain connection. In this regard further, a wax seal thereat is also preferred to have a commensurate opening for receiving the passageway. Accordingly, the vertical cross-sectional height of the plumbing for the urinal flush modality is minimized so that a toilet so equipped is kept generally within conventional toilet dimensionalities.

Accordingly, it is an object of the present invention to provide a toilet having two flush modalities, wherein the bowl valve thereof is in the form of a pop-up valve.

It is another object of the present invention to provide a toilet having two flush modalities wherein the vertical cross-sectional height is minimized.

These, and additional objects, advantages, features and benefits of the present invention will become apparent from the following specification.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a perspective view of a toilet with two flush modalities featuring the improvements according to the present invention.

FIG. **2** is a partly sectional side view of the toilet having two flush modalities, seen along line **2**—**2** of FIG. **1**.

FIG. **3** is a partly sectional side view of the toilet having two flush modalities, wherein the bowl valve is shown in the closed state.

FIG. **4** is a partly sectional side view of the toilet having two flush modalities, wherein the bowl valve is shown in the open state.

FIG. **5** is a partly sectional view along line **5**—**5** of FIG. **4**, showing in particular the pivot ball assembly of the pop-up type of bowl valve.

FIG. **6** is a partly sectional top plan view of the drain connection of the urinal flush modality plumbing of the toilet of FIG. **1**, seen along line **6**—**6** of FIG. **4**.

FIG. **7** is a partly sectional view along line **7**—**7** of FIG. **6**.

FIG. **8** is a top plan view of a slotted flange of a floor drain connector according to the present invention.

FIG. **9** is a partly sectional view along line **9**—**9** of FIG. **6**.

FIG. **10** a partly sectional side view of the toilet having two flush modalities, particularly showing alternative plumbing of the urinal flush modality.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Ref erring now to FIGS. **1** and **2**, a two flush modality toilet **10** according to the present invention is depicted. The two flush modality toilet **10** includes a bowl **12**, a tank **14**, a bowl valve **16** in the form of a pop-up valve including a pop-up stopper **55** and a pop-up seat **58** therefor, a bowl valve control **18**, and an auxiliary flush control **20** at the tank. The tank **14** is connected with an external source of pressurized potable water via a supply pipe (not shown) in a conventional manner well known in the art. The structure and function for providing actuation of the conventional flush modality is determined conventionally by operation of a conventional flush control **22** including: a conventional flush lever **22***a*, a conventional flush feed **22***b* for supplying flush water from the tank to the bowl, a conventional float stopper **22***c* connected by a linkage **22***d* for selectively sealing the conventional flush feed, and a conventional tank water height sensing water inflow valve which is connected to the supply pipe (not shown) for refilling the tank with flush water. Preferably, the conventional tank water height sensing water inflow valve is of the kind without a ball-float and rod-arm, as these components could make the tank interior too crowded to allow for the auxiliary flush control, as for example the FLUIDMASTER (a registered trademark) Model 400A fill valve manufactured by Fluidmaster, Inc. of Anaheim, Calif. 92803. (See FIG. 3 of herein incorporated U.S. Pat. 5,5,48,850.)

The bowl **12** includes a trap **24** defined by a depending projection **26**, an upleg portion **28** of the bowl outlet **30**, and a downleg portion **32** of the bowl outlet. The upleg and downleg portions **28**, **32** are of a generally inverted U-shape, wherein the upleg portion defines in part the bottom portion of the bowl **12**. The height of the upleg portion **28** is higher than the location of the terminous **26***a* of the depending projection **26**. Accordingly, when water **34** fills the trap **24** at the bottom portion of the bowl **12** to a height approximated by the height of the upleg portion **28**, the water immerses the terminous **26***a* of the depending projection **26**, thereby sealing-off the bowl from the drain **36**. The trap **24** has a low point whereat the bowl valve **16** is located; accordingly, when the bowl valve is opened all the liquid in the trap will drain therethrough.

In operation, when a user has completed using the two flush modality toilet **10** the user selects the flush modality. If solid (and/or liquid) waste is present in the bowl **12**, the user selects the conventional flush modality by pressing the conventional flush lever **22***a*. If only liquid waste is present in the bowl **12**, the user may select (as an alternative to selecting the conventional flush modality) a urinal flush modality by actuating the bowl valve **16** to thereby drain the liquid waste from the bowl and actuating the auxiliary flush control **20** via a urinal flush lever **20***a* to thereby restore the water at the trap **24** of the bowl **12**.

The structure and function for carrying out the two flush modality toilet **10** will be detailed hereinbelow with reference being additionally directed to remaining FIGS. **3** through **10**.

A base **38** is provided, preferably integral with the bowl **12**. Alternatively the base **38** could be a separate piece as for example constructed of plastic, which forms a platform upon which the toilet proper is situated. As shown in FIG. **2**, and as can be appreciated by comparative reference to FIG. **1**, the base **38** is provided with a drain channel **42**. The drain channel **42** is aligned with the downleg portion **32** of the bowl outlet **30**. A tailpiece **44** is threadably engaged with a pop-up valve body **45** (which is, in turn, threadably engaged with the aforementioned pop-up seat **58**). Consequently, when the conventional flush modality is selected, flushing discharge from the bowl **12** exits the bowl outlet **30**, goes into the drain channel **42** and into the drain **36**. Consequently further, when the urinal flush modality is selected, the liquid in the trap **24** drains out the bowl valve **16**, goes through the the pop-up valve body **45**, enters into the tailpiece **44**, passes through a passageway **46**, and then enters into the drain **36** via an entry port **47** at the drain channel **42**.

As mentioned, the bowl valve is in the form of a pop-up valve, wherein numeral **16** refers commonly to either term for this component. The pop-up stopper **55**, the pop-up seat **58**, and a pivot ball assembly **57** are of a generally known construction as conventionally used for bathroom sinks. The pivot ball assembly **57** is shown best at FIGS. **3** and **4**. The pop-up stopper **55** has an extension member **55***a* which hooks onto a, pivot rod **59**. The pivot rod **59** passes through a pivot ball **61** and then exits the pivot ball assembly **57**. The pivot ball **61** is rotatably seated in sealing relation with a ball socket **63** formed in the pivot seal assembly **57**. Accordingly, pivoting of the pivot rod **59** at the pivot ball **61** results in the pop-up stopper moving up and down in relation to the pop-up valve body **45**. Since the pop-up valve body **45** is threadably engaged with the pop-up seat **58**, and since the pop-up seat is sealingly engaged, such as via a gasket and

nut threaded on the stopper seat, with the toilet bowl **12** about a drainage hole **15** formed therein at its lowest point, the vertical movement of the pop-up stopper **55** controls whether or not the bowl **12** is able to hold water **34** in the trap **24**.

The bowl valve control **18** is composed of a foot pedal **50** which is connected to the pivot rod **59**, and a biasing spring **54** connected, as for example with an interior partition wall. The biasing spring **54** biases the pivot rod **59** so that the pop-up stopper **55** is normally in sealing engagement with the pop-up seat **58**, wherein the bowl (pop-up) valve **16** is normally in the closed state unless the foot pedal **50** is depressed by a user.

In operation, as shown in FIGS. **3**, **4** and **5**, when the foot pedal **50** is depressed to a down position against biasing of the biasing spring **54** (FIG. **4**), the pivot rod **59** pivots and pushes the pop-up stopper **58** upwardly away from the pop-up seat **58** and into the bowl **12**, wherein the bowl valve **16** is in the open state (FIG. **4**). Now, whatever liquid is in the bowl will drain in accordance with the above recounted urinal flush modality through the bowl valve and, as recounted, into the drain **36**. Upon release of the foot pedal **50**, the biasing of the biasing spring **54** will cause the foot pedal to rise to an up position (FIG. **3**) and the pop-up stopper **55** of the bowl valve **16** to move downwardly and reseat in sealing relation with respect to the pop-up seat **58**, wherein the bowl valve is returned to the closed state (FIG. **3**) and water is able to be held in the trap.

In order that the proper amount of flush water is introduced into the bowl **12** depending upon the selected flush modality, the tank **14** is equipped with two flush controls: a conventional flush control **22** and an auxiliary flush control **20**.

When the conventional flush modality is selected, the conventional flush lever **22***a* is turned, separating the float stopper **22***c* from the conventional flush feed **22***b* in a conventional manner, wherein new water will enter into the tank from the external water line via the conventional tank water height sensing water inflow valve. Flush water **60** from the tank **14** will enter into the bowl **12** conventionally and exit the bowl outlet **30** as described hereinabove. After the flush water **60** is exhausted, the conventional float stopper **22***c* sealingly seats on the conventional flush feed **22***b*, and the conventional tank water height sensing water inflow valve within the tank will turn off the incoming water when the tank water reaches its predetermined height.

When the urinal flush modality is selected, it is desired to only supply enough water to the bowl **12** to refill the trap **24**; approximately one quart is sufficient for this purpose. In order that not all the tank water is flushed into the bowl **12** after the foot pedal **50** is depressed and released, even though the tank flush water is, itself, used, it is used only to a limited depth. To accomplish this, the auxiliary flush control **20** has an overflow tube **66** modified to accept connection with an auxiliary flush tube **94**. The auxiliary flush tube **94** connects to the overflow tube **66** somewhat near the bottom of the tank **14**' and emanates therefrom at an acute angle, then bends into a vertical orientation that is parallel with the overflow tube **66**. The end of the auxiliary flush tube **94** is provided with a stopper seat **95** for an auxiliary float stopper **96** to seal against. The auxiliary float stopper **96** is pivotally connected to the overflow tube **66**, as for example by a studded ring mounted thereupon. The auxiliary float stopper **96** is connected with an auxiliary linkage **80** which is in turn connected to the auxiliary control lever **20***a*. As shown in FIG. **1**, the height of the stopper seat **95** is located a predetermined distance beneath the preset fill height of the flush water in the tank **14** so that substantially the amount of water needed to fill the trap **24** is above the stopper seat **95** and exits the tank (inclusive of whatever new water enters into the tank via the conventional tank water height sensing water inflow valve during exiting of water through the auxiliary flush tube), more-or-less about one gallon of water. An example of a known product that could be used as an auxiliary float stopper (perhaps with some modification) is a Touch Flush Assembly, product no. 628P of Lavelle Industries, Inc. of Burlington, Wis. 53105.

In operation, after the foot pedal **50** has been depressed and then released thereby opening, draining and re-closing the trap **24**, the auxiliary float stopper **96** is raised, via the auxiliary flush linkage **80**, by pressing the auxiliary flush lever **20***a*. New water will enter into the tank **14** via the conventional tank water height sensing water inflow valve until the preset height of flush water in the tank is reached, whereupon the tank will be refilled.

The preferred drain connection aspects are depicted most clearly in FIGS. **6** through **9**.

As mentioned, the passageway **46** terminates into the drain channel **42** (which may be considered a portion of the bowl outlet **30**) at the entry port **47**. In this regard in order to minimize cross-sectional height, the flange **52** of the drain connector **49** has a slot **52***a* for receiving therethrough the passageway **46**. It is preferred for the entry port **47** to have a overhanging upper side **47***a* in relation to the lower side **47***b*, as shown best at FIG. **7**, in order to facilitate waste movement through the drain channel **42** without tendency to enter into the passageway **46**.

A wax ring **62** is provided to seal the passageway **46** and drain channel **42** with respect to the drain connector **49**. In this regard it is preferred for the wax seal **62** to be provided with an opening **62***a*, such as a cut-out, into which the passageway is received. The passageway **46** is sealed with respect to the drain channel **42**, which seal may be provided via seals in addition to the wax ring **62**, such as for example plumber's putty or a resilient gasket.

FIG. **10** depicts a modification of the toilet with two flush modalities according to the present invention, wherein the modification resides in the aforementioned passageway (which is preferably square or rectangularly cross-sectioned) and pop-up valve body being combined into a pop-up valve elbow **64** having the aforementioned entry port **47**.

To those skilled in the art to which this invention appertains, the above described preferred embodiment may be subject to change or modification. For example, the disclosure herein, which is preferred, may be modified to include any of the embodiments disclosed in herein incorporated U.S. Pat. No. 5,548,850. Such change or modification can be carried out without departing from the scope of the invention, which is intended to be limited only by the scope of the appended claims.

What is claimed is:

1. A toilet having two flush modalities, the toilet being structured for connecting to a drain and to a source of pressurized water, the toilet comprising:

a bowl having a trap formed therein for holding liquid, said trap having a low point, said bowl having a bowl outlet connected with said trap, said bowl having a drainage hole at said low point;

conventional flush modality means for selectively delivering water into said bowl to thereby flush said bowl and to refill said trap with water; and

urinal flush modality means comprising:

a bowl valve comprising:

a pop-up seat sealingly connected with said bowl at the drainage hole thereof;

a pop-up stopper seatably enagageable with said pop-up seat, said pop-up stopper being movable between a sealingly seated position on said pop-up seat to an open position wherein said pop-up stopper is located a predetermined distance into said bowl away from said pop-up seat; and

pivot ball assembly means connected to said pop-up stopper for effecting movement of said pop-up stopper between said seated and open positions thereof;

bowl valve control means connected with said pivot ball assembly means for selecting said open and seated positions of said pop-up stopper;

passageway means connected with said pop-up seat for providing a liquid passageway between said pop-up seat and said bowl outlet; and

auxiliary flush control means for selectively delivering a predetermined amount of water to said bowl to thereby refill said trap with water when said pop-up stopper is in said seated position.

2. The toilet having two flush modalities of claim **1**, further comprising drain connection means for connecting said bowl outlet to a drain; wherein said drain connection means comprises:

said bowl outlet further comprising a drain channel; and

a drain connector for connecting said drain channel to a drain, said drain connector having a flange, said flange having a slot;

wherein said passageway means is received into said slot, and wherein said passageway means has an entry port which fluidically communicates with said drain channel.

3. The two flush modality toilet of claim **2**, wherein said entry port has an upper side and an opposite lower side, wherein said upper side overhangs said lower side with respect to said drain channel.

4. The two flush modality toilet of claim **3**, wherein drain connection means further comprises a wax ring, said wax ring having an opening, said opening receiving said passageway means.

5. A toilet having two flush modalities, the toilet being structured for connecting to a drain and to a source of pressurized water, the toilet comprising:

a tank having an overflow tube;

conventional flush control means connected with said tank for filling said tank with a preselected amount of water derived from a source of pressurized water;

a bowl connected with said tank, said bowl having a trap formed therein for holding liquid, said trap having a low point, said bowl having a drainage hole at said low point, wherein the overflow tube is connected with said bowl;

conventional flush modality means connected with said tank for selectively delivering water in said tank into said bowl to thereby flush said bowl through said drainage hole and to refill said trap with water; and

urinal flush modality means comprising:

a bowl valve comprising:

a pop-up seat sealingly connected with said bowl at the drainage hole thereof;

a pop-up stopper seatably enagageable with said pop-up seat, said pop-up stopper being movable between a sealingly seated position on said pop-up seat to an open position wherein said pop-up stopper is located a predetermined distance into said bowl away from said pop-up seat; and

pivot ball assembly means connected to said pop-up stopper for effecting movement of said pop-up stopper between said seated and open positions thereof;

bowl valve control means connected with said pivot ball assembly means for selecting said open and seated positions of said pop-up stopper;

drain connection means for connecting said drainage hole to a drain;

passageway means connected with said pop-up seat for providing a liquid passageway between said pop-up seat and said drain connection means; and

auxiliary flush control means for selectively delivering a predetermined amount of water to said bowl to thereby refill said trap with water when said pop-up stopper is in said seated position.

6. The two flush modality toilet of claim **5**, wherein said bowl valve control means comprises:

a foot pedal movable with respect to said bowl from an up position to a down position;

connection means for connecting said foot pedal with said pivot ball assembly means, wherein movement of said pop-up stopper between said seated and open positions is responsive to movement of said foot pedal between said up and down positions; and

biasing means connected with said connection means for biasing said foot pedal to said up position.

7. The two flush modality toilet of claim **6**, wherein said auxiliary flush control means comprises:

an auxiliary flush tube connected with the overflow tube, wherein said auxiliary flush tube has an open end located at a predetermined location in said tank wherein an amount of water above said open end which is determined by said tank fill means substantially is said predetermined amount of water;

float stopper means for selectively sealing said open end of said auxiliary flush tube; and

float stopper control means for selectively releasing said float stopper means from sealing engagement with said open end to thereby cause water in said tank to enter into the overflow tube.

8. The two flush modality toilet of claim **7**, wherein said drain connection means comprises:

a drain channel connected with said bowl outlet; and

a drain connector for connecting said drain channel to a drain, said drain connector having a flange, said flange having a slot;

wherein said passageway means is received into said slot, and wherein said passageway means has an entry port which fluidically communicates with said drain channel.

9. The two flush modality toilet of claim **8**, wherein said entry port has an upper side and an opposite lower side, wherein said upper side overhangs said lower side with respect to said drain channel.

10. The two flush modality toilet of claim **9**, wherein drain connection means further comprises a wax ring, said wax ring having an opening, said opening receiving said passageway means.

11. The two flush modality toilet of claim **5**, wherein said drain connection means comprises:

a drain channel connected with said bowl outlet; and

a drain connector for connecting said drain channel to a drain, said drain connector having a flange, said flange having a slot;

wherein said passageway means is received into said slot, and wherein said passageway means has an entry port which fluidically communicates with said drain channel.

12. The two flush modality toilet of claim **11**, wherein said entry port has an upper side and an opposite lower side, wherein said upper side overhangs said lower side with respect to said drain channel.

13. The two flush modality toilet of claim **12**, wherein drain connection means further comprises a wax ring, said wax ring having an opening, said opening receiving said passageway means.

14. In a toilet having two flush modalities, the toilet being structured for connecting to a drain and to a source of pressurized water, the toilet having a bowl, the bowl having a trap formed therein for holding liquid, the trap having a low point, the bowl having a bowl outlet connected with the trap, the bowl having a drainage hole at the low point, an improvement thereto comprising:

a bowl valve comprising:

a pop-up seat sealingly connected with the bowl at the drainage hole thereof;

a pop-up stopper seatably enagageable with said pop-up seat, said pop-up stopper being movable between a sealingly seated position on said pop-up seat to an open position wherein said pop-up stopper is located a predetermined distance into the bowl away from said pop-up seat; and

pivot ball assembly means connected to said pop-up stopper for effecting movement of said pop-up stopper between said seated and open positions thereof;

bowl valve control means connected with said pivot ball assembly means for selecting said open and seated positions of said pop-up stopper; and

passageway means connected with said pop-up seat for providing a liquid passageway between said pop-up seat and the bowl outlet.

* * * * *

Exhibit F

U.S. Pat. No. 5,448,784

US005448784A

United States Patent [19]

Smiley

[11] Patent Number: 5,448,784

[45] Date of Patent: Sep. 12, 1995

[54] **URINAL ASSEMBLY AND ELECTRICALLY ACTUATED VALVE FOR SAME**

[76] Inventor: **Everett J. Smiley**, 1326 Sandtrap Dr., SW., Fort Myers, Fla. 33919

[21] Appl. No.: **216,056**

[22] Filed: **Mar. 22, 1994**

Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 994,354, Dec. 21, 1992, Pat. No. 5,301,374, which is a continuation-in-part of Ser. No. 612,920, Nov. 13, 1990, abandoned.

[51] **Int. Cl.**[6] **E03D 9/00**

[52] **U.S. Cl.** **4/341**; 251/129.15; 4/DIG. 3

[58] **Field of Search** ..... 4/340, 341, 342, 406, 4/410, 420.2, 420.3, 445, 446, DIG. 3; 251/129.15, 129.22

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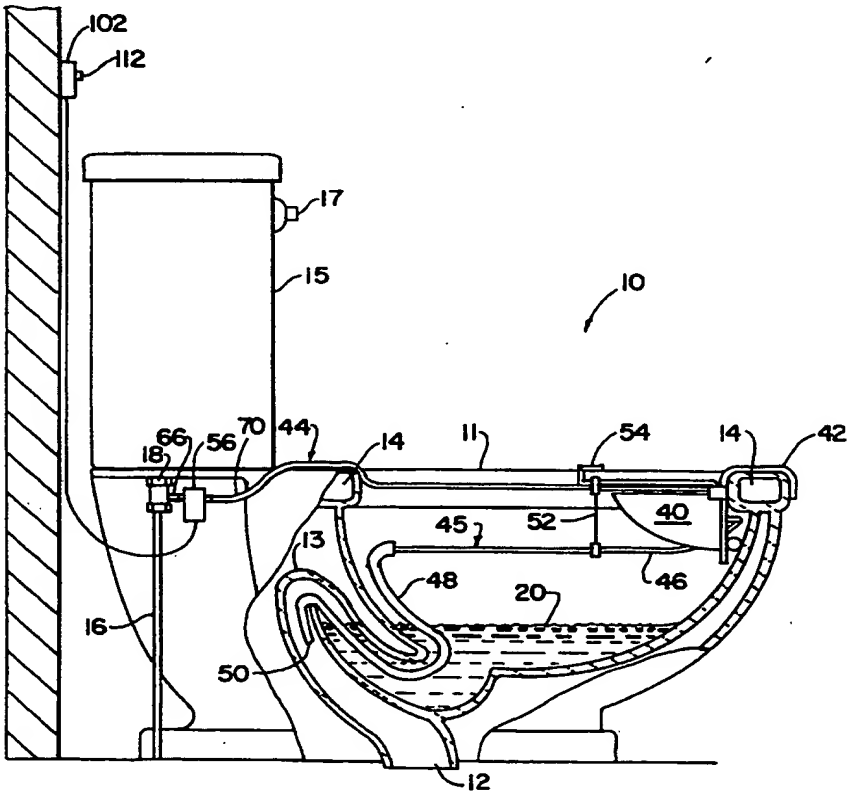
Primary Examiner—Charles E. Phillips
Attorney, Agent, or Firm—William E. Noonan

[57] **ABSTRACT**

A urinal assembly is disclosed for use in a toilet apparatus having a toilet bowl, a tank communicably connected to and located generally above the toilet bowl and a supply conduit for delivering water under service line pressure to the tank. The toilet assembly comprises a urinal bowl for mounting within the toilet bowl. An inlet conduit is interconnected between the supply conduit and the bowl. A valve is interconnected to the inlet conduit for controlling the flow of water under service line pressure therethrough. An electrical solenoid is employed to selectively open and close the valve to introduce water to the urinal bowl through the inlet conduit. A discharge conduit is provided for discharging water from the urinal bowl when the bowl is flushed.

3 Claims, 1 Drawing Sheet



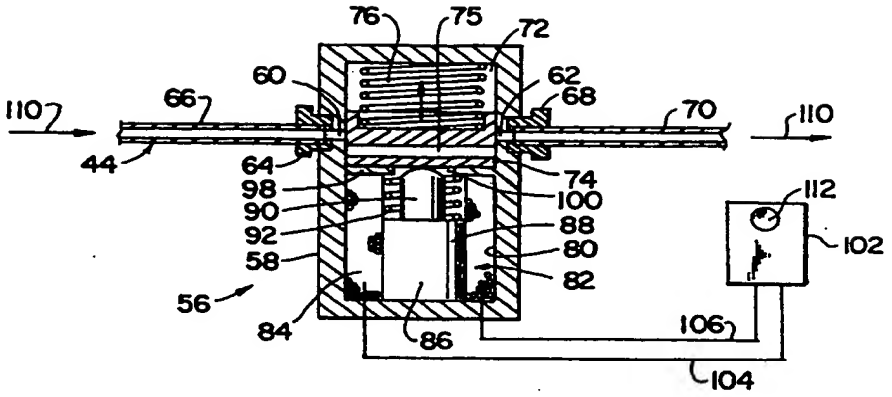

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FIG. 2

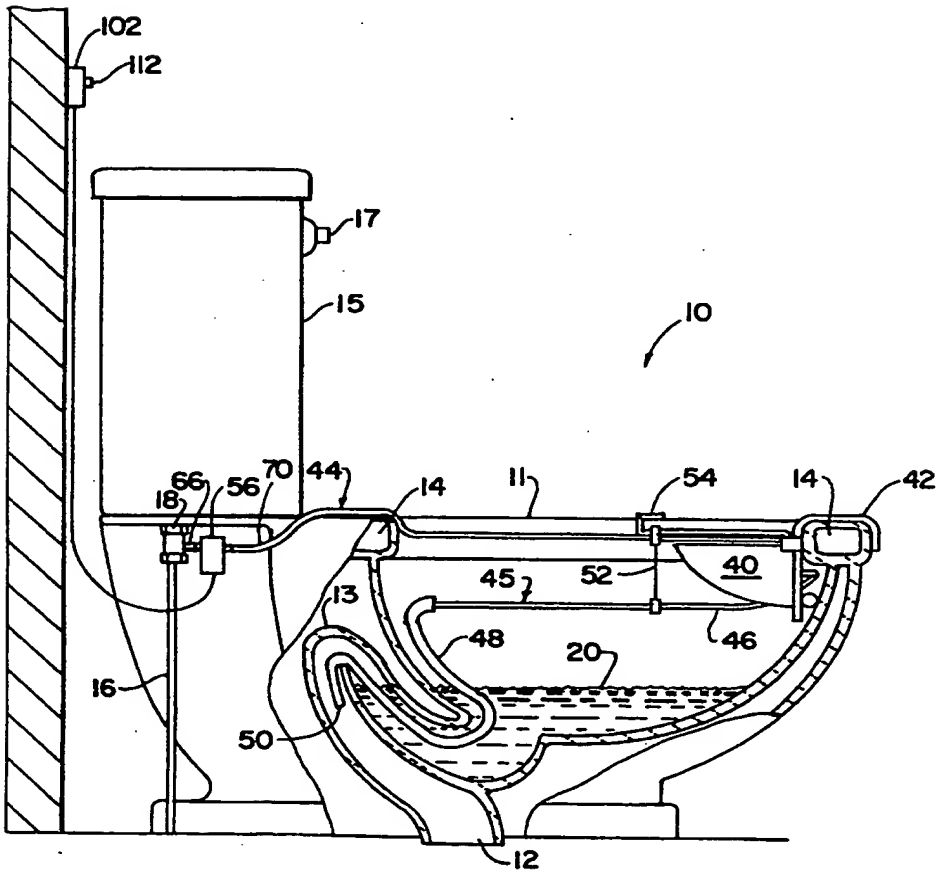
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FIG. 1

URINAL ASSEMBLY AND ELECTRICALLY ACTUATED VALVE FOR SAME

RELATED APPLICATIONS

This application is a continuation in part of Ser. No. 994,354, filed Dec. 21, 1992, now U.S. Pat. No. 5,301,374, which is a continuation in part of Ser. No. 612,920 filed Nov. 13, 1990, now abandoned.

FIELD OF THE INVENTION

This invention relates to a urinal assembly for use in combination with a standard toilet and, in particular, to a water saving urinal assembly that is flushed through the use of an electrically actuated valve mechanism.

BACKGROUND OF THE INVENTION

Conventional water closets waste billions of gallons of water annually. Each time a typical toilet is flushed, at least several gallons of water are used. Such an amount is clearly excessive, particularly when only liquid waste is being flushed.

To reduce water usage, a number of toilets have been developed that employ partitioned sections for accommodating liquid and solid waste. One known toilet, U.S. Pat. No. 3,336,602, uses a separate urinal bowl that is flushed by water under a gravity pressure head in the reservoir tank of the toilet. That apparatus requires the water in the tank to remain at a typically high level in order for the urinal flush system to operate. The system will not operate if the user desires to significantly reduce the amount of water used to flush the main bowl. Additionally, this system requires a pair of separate flush handles and cannot be retrofit onto existing toilets.

The above problems are largely overcome by my co-pending application Ser. No. 994,354, which relates to a urinal assembly that is flushed using incoming service line pressure. Although that invention teaches a number of advantages, it also requires the use of a relatively intricate mechanical valve mechanism to interconnect the urinal assembly with the source of incoming service line water. I have recognized that the need exists for an improved, simpler valve mechanism that operates electrically. I have further recognized that the operation of my urinal assembly will be facilitated considerably if the valve interconnecting the incoming service line and the urinal assembly is located outside of the toilet tank.

SUMMARY OF INVENTION

It is therefore an object of this invention to provide a simpler, improved, electrically operated valve mechanism for introducing water under service line pressure to a urinal assembly integrated with and operable independently of a standard toilet.

It is a further object of this invention to provide a urinal assembly in combination with a toilet that can be flushed independently of the toilet thereby resulting in considerable conservation of water.

It is a further object of this invention to provide a valve mechanism for introducing water into a urinal assembly of a toilet, which valve is located entirely outside of the toilet tank.

This invention results from the realization that an improved, simpler valve for providing water under service line pressure to a urinal assembly integrated into a conventional toilet may be accomplished by employing an electrically activated valve in an inlet conduit that is connected directly to the incoming service line beneath the toilet tank. As a result, the valve is located outside of the toilet tank and installation, servicing and operation are facilitated greatly.

This invention features a urinal assembly for use in a toilet apparatus having a toilet bowl, a tank communicably connected to and located generally above the bowl, a supply conduit for delivering water under service line pressure to the tank and a sewer line connected to the toilet bowl for discharging the contents of the bowl when the bowl is flushed. The urinal assembly includes a urinal bowl for mounting within the toilet bowl. There is an inlet conduit interconnected between the supply conduit and the bowl. A valve is operably interconnected to the inlet conduit for controlling the flow of water under service line pressure therethrough. There are electrically activated drive means for selectively opening the valve to introduce water under service line pressure into the bowl to flush the bowl. The drive means also selectively close the valve to block the flow of water therethrough. A discharge conduit is interconnected between the urinal bowl and the sewer line for discharging the contents of the urinal bowl when the urinal bowl is flushed.

In a preferred embodiment, the means for driving include a solenoid. The inlet conduit may include first and second segments that are interconnected by the valve. The valve may include a valve housing, a valve element movably mounted in the valve housing and having formed therethrough a channel that is communicably alignable with the first and second segments of the inlet conduit. A spring or other means are provided for biasing the valve element into a closed condition within the housing such that the channel is not aligned with the first and second segments. The drive means selectively urge the valve element against the spring means to align the channel with the first and second segments and open the valve.

Preferably, timer means are provided for directing the drive means to hold the valve open for a predetermined period. Such timer means may include a solid state timer.

The valve and drive means may be located beneath the toilet tank. Bracket means may be provided for releasably mounting the urinal bowl to the main toilet bowl.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

Other objects, features and advantages will occur from the following description of preferred embodiments and the accompanying drawings, in which:

FIG. 1 is an elevational, side view, partly in cross section, of a toilet including the urinal assembly and valve of this invention; and

FIG. 2 is a partly cross sectional, partly schematic view of the valve mechanism and electrically activated drive means.

There is shown in FIG. 1 a toilet apparatus 10 employing the urinal assembly of this invention. Apparatus 10 includes a main toilet bowl 11 that is connected in a known manner to a discharge sewer line 12 through a gooseneck trap 13. A channel 14 is formed about the rim of toilet bowl 11. Channel 14 includes a plurality of conventional holes, not shown, that deliver water from a conventional reservoir tank 15 each time the main bowl 11 is flushed by depressing handle 17.

A pressurized water service line 16 is interconnected to the bottom of tank 15 in a conventional manner through a fitting 18. Water service line 16 provides replacement water in a standard manner to tank 15 each time main toilet bowl 11 is flushed. When handle 17 is pivoted downwardly, the water which is in tank 15 discharges through the channel 14 and through the channel holes into bowl 11. As a result, water 20 in bowl 11 is flushed into sewer line 12 through gooseneck trap 13.

The present invention comprises a urinal bowl 40 that is mounted by a hook-like bracket 42 to the inside wall of main toilet bowl 11 at a position proximate the front of the bowl 11. Bowl 40 is preferably composed or porcelain or other conventional toilet bowl materials similar to those comprising main bowl 11. The opened upper end of bowl 40 is positioned slightly below the upper lip of main bowl 11. It should be understood that in alternative embodiments, the urinal bowl may be permanently mounted to the main bowl 11. Such construction is illustrated in my co-pending application Ser. No. 994,354.

A PVC water inlet conduit 44 extends largely along the rim of bowl 11 and interconnects pressurized service line fitting 18 and urinal bowl 40. An outlet conduit 45 is operably connected to bowl 40 and includes a generally rigid section 46 that is formed from PVC pipe or similar material and a hose section 48 that extends below the water line and into gooseneck trap 13. Conduit 45 conducts waste that is flushed from bowl 40 in the manner described below and such waste is discharged through terminal end 50 of conduit 45 into sewer line 12.

Inlet and outlet conduits 44 and 45 are held together by a connecting rod 52. A bracket 54 joined to connector 52 and to the forward end of the urinal bowl hooks over the rim of bowl 11 so that the entire urinal assembly is mounted securely to the main bowl. In alternative embodiments, the urinal assembly may employ a structure analogous to that illustrated in FIG. 8 of my co-pending patent application Ser. No. 994,354.

A valve assembly 56 controls the flow of water under service pressure through inlet conduit 44 from line 16 to the urinal bowl 40. As best shown in FIG. 2, valve assembly 56 includes a valve housing 58 having an inlet port 60 and an outlet port 62. Inlet port 60 is connected through a fitting 64 to a first segment 66 of inlet conduit 44. Similarly, outlet port 62 is communicably connected through a fitting 68 with a second segment 70 of inlet conduit 44. Housing 56 includes an upper chamber 72 containing a slidable valve element 74 and a helical compression spring 76. The valve housing further includes a lower chamber 80, in which is disposed a conventional solenoid mechanism 82. The solenoid mechanism includes an electromagnetic coil 84 and a permanent magnet piston 86 having a wide diameter portion 88 and a narrow diameter portion 90. A second helical compression spring 92 is wound about narrow portion 90 of piston 86 and extends between the central housing wall 98 that separates chambers 72 and 80 and an upper shoulder of wide diameter piston portion 88. The upper end of piston portion 90 extends into a central opening 100 formed through housing wall 98.

Coil 82 is selectively activated by a solid state timer 102 that is connected to coil 82 via electrical leads 104 and 106. Under normal conditions, when electromagnetic coil 82 is deactivated, magnetic piston 86 is urged downwardly by springs 76 and 92 into the lowermost position in the solenoid, which position is illustrated in FIG. 2. Coil spring 76 likewise urges valve element 74 downwardly within chamber 72 such that the central channel 75 in element 74 is not aligned with the channels through conduit segments 66 and 70. As a result, valve element 74 is closed to block the passage of water through inlet conduit 44 in the direction of arrows 110. Water under service line pressure is delivered instead through line 16 (FIG. 1) into tank 15 only, so that the main bowl 11 of the toilet can be flushed when required.

After the urinal bowl 40 is used, that bowl can be flushed independently of bowl 11 by activating solid state timer 102. A timer button 112 is pressed so that for a predetermined time of, for example 3–10 seconds, a signal is provided over lines 104 and 106 (FIG. 2) to coil 82. This causes the coil to energize during that time period. Activation of the coil drawing magnetic piston 86 upwardly so that the piston is centered in coil 82. Piston 86 compresses spring 92 and narrow diameter portion 90 slides through opening 100 and bears against valve element 74. The valve element is driven upwardly against spring 76 until central channel 75 is aligned with openings 60 and 62 in housing 58. This aligns the valve element with segments 66 and 70 of inlet conduit 44. An open passageway is thereby provided through conduit 44, between service line 16 and urinal bowl 40. As a result, water under service pressure is conducted through the inlet conduit from service line 16 to the urinal bowl. This water flushes the bowl and is discharged through outlet conduit 45, which directs the liquid waste and flushing water into sewer line 12. The details of this flushing operation are described more fully in my co-pending application Ser. No. 994,354.

When the predetermined time period dictated by solid state timer 102 has elapsed, coil 84 is de-energized and spring 92 again urges piston 86 into the position shown in FIG. 2. As a result, spring 76 again urges valve element 74 into a closed condition and water is blocked from entering urinal bowl 40 through inlet conduit 44.

In alternative embodiments, solid state timer 102 may be replaced by various types of conventional switches, which can operated in a known manner to activate solenoid 82 and thereby control flushing of the urinal bowl. The flushing operation may be performed for a predetermined time period or for as long as the switch is held manually closed.

The placement of switch assembly 56 beneath the toilet tank greatly facilitates flushing of the urinal bowl with water under service pressure. Repairs can be performed relatively quickly and easily without requiting work to be done within the toilet tank. Additionally, a simpler, conventional toilet handle may be used.

Although specific features of the invention are shown in some drawings and not others, this is for convenience only, as each feature may be combined with any or all of the other features in accordance with the invention. Other embodiments will occur to those skilled in the art and are within the following claims.

What is claimed is:

1. A urinal assembly for use in a toilet apparatus having a toilet bowl, a tank communicably connected to and located generally above said bowl, a supply conduit for delivering water under service line pressure to said tank and a sewer line connected to said toilet bowl for discharging the contents of said bowl when said bowl is flushed, said urinal assembly comprising:

a urinal bowl for mounting within said toilet bowl;

an inlet conduit interconnected between said supply conduit and said urinal bowl;

a valve mechanism operably interconnected to said inlet conduit in a fixed position entirely below the bottom of said tank for controlling the flow of water under service line pressure through said inlet conduit;

an electrically activated solenoid that selectively opens said valve to introduce water under service line pressure into said urinal bowl to flush said urinal bowl and closes said valve to block the flow of water into said urinal bowl;

a solid state timer mounted permanently on a wall adjacent said toilet for directing said drive means to hold said valve open for a predetermined time period; and

a discharge conduit interconnected between said bowl and said sewer line for discharging the contents of said urinal bowl when said urinal bowl is flushed.

2. The assembly of claim 1 further including bracket means for releasably mounting said urinal bowl to said main toilet bowl.

3. The assembly of claim 1 in which said inlet conduit includes first and second segments that are operably interconnected by said valve mechanism, said valve mechanism including a valve housing, a valve element movably mounted in said valve housing and having formed therethrough channel means that are communicably alignable with said first and second segments of said inlet conduit, spring means for biasing said valve element into a closed condition within said housing such that said channel is not aligned with said first and second segments, said drive means including means for selectively urging said valve element against said spring means to align said channel means with said first and second segments and open said valve mechanism.

* * * * *

Exhibit G

U.S. Pat. No. 4,197,598

United States Patent [19]

Lemmon

[11] **4,197,598**

[45] **Apr. 15, 1980**

[54] **TOILET**

[76] Inventor: **Newton R. Lemmon, 3030 Fairview Rd., Hollister, Calif. 95023**

[21] Appl. No.: **892,602**

[22] Filed: **Apr. 3, 1978**

Related U.S. Application Data

[63] Continuation of Ser. No. 762,607, Jan. 26, 1977, abandoned.

[51] **Int. Cl.²** **E03D 3/12; E03D 1/14**

[52] **U.S. Cl.** **4/326; 4/341; 4/415**

[58] **Field of Search** 4/326, 325, 324, 415, 4/341, 342

[56] **References Cited**

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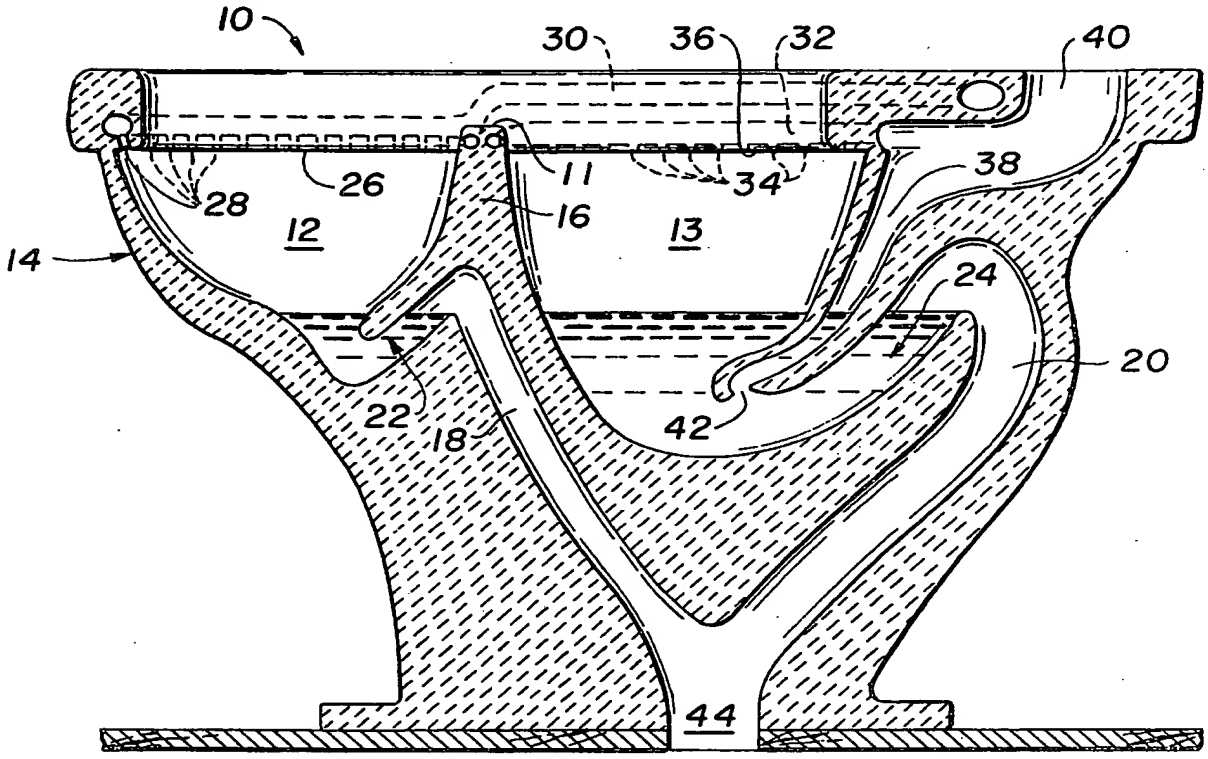
Primary Examiner—Lenard A. Footland

Attorney, Agent, or Firm—John L. McGannon

[57] **ABSTRACT**

A siphoning water closet incorporating a toilet bowl having a first flushable reservoir for liquid wastes and a second flushable reservoir for solid wastes, the reservoirs being separately flushable so as to expend less flushing water and to expel less disposable sewage than conventional single flush siphoning water closets.

4 Claims, 3 Drawing Figures



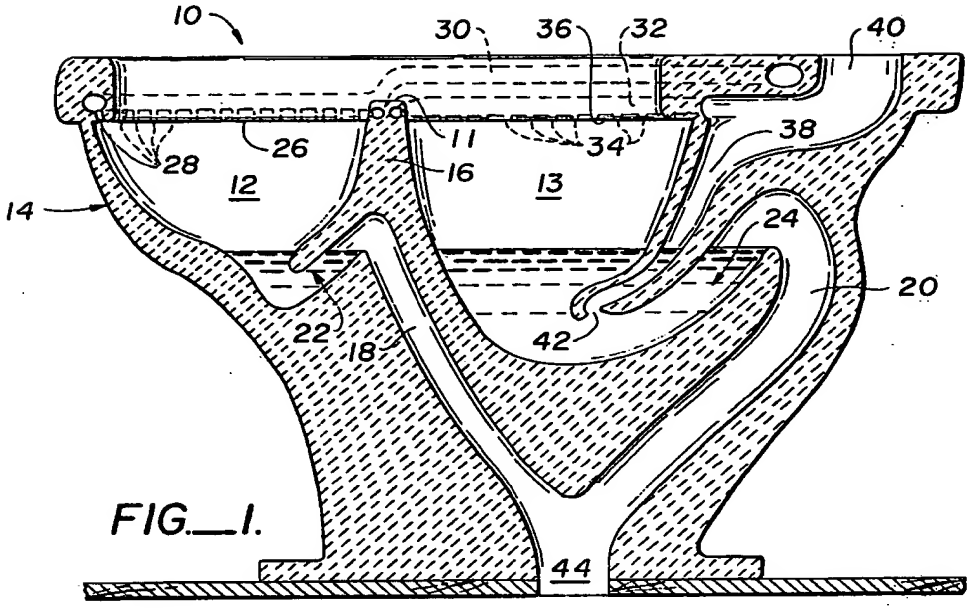
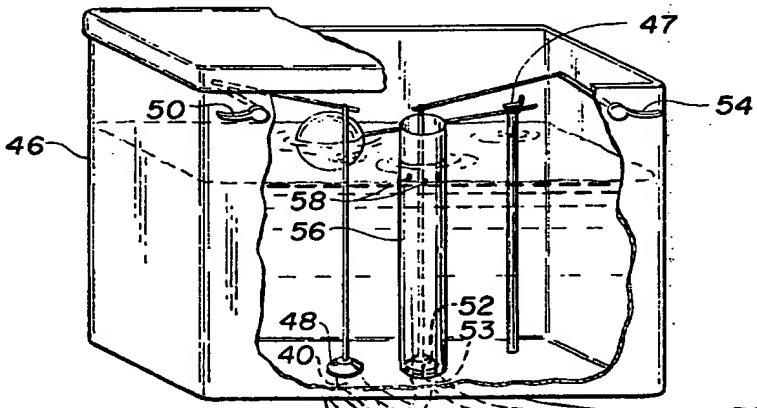


FIG. 1.



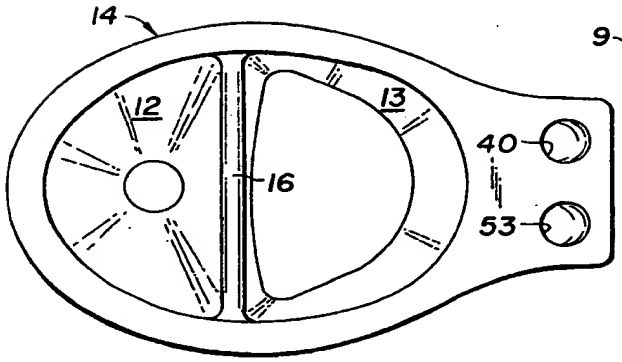


FIG. 3.

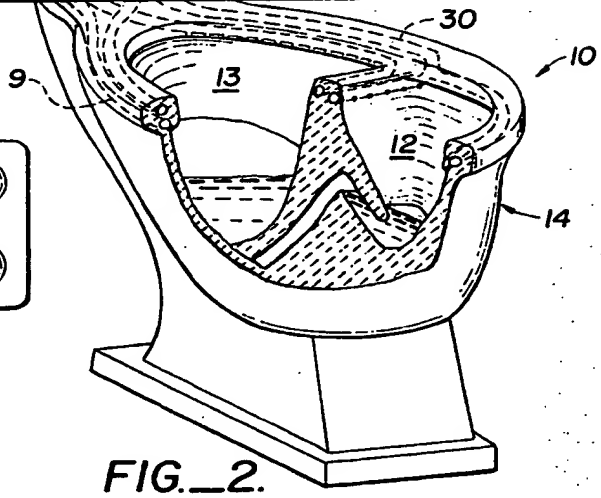


FIG. 2.

TOILET

This is a continuation of application Ser. No. 762,607 filed Jan. 26,1977, now abandoned.

BACKGROUND OF THE INVENTION

This invention relates to water closets and particularly to a water economizing siphoning water closet.

Conventional tank-type and valve-type water closets expend five to eight gallons of flush water at each use in order to assure that the toilet bowl is thoroughly evacuated of waste materials, both solid and liquid. However, it can be appreciated that liquid waste requires substantially less flush water than do solid wastes. With the current consciousness of the relative scarcity of resources, including water, and with the continued desire to maintain a high level of cleanliness in sanitary facilities, it is apparent that a need exists for an improved water closed capable of conserving water while assuring sanitary disposal of human wastes. In addition, the need exists to reduce the amount of sewage generated by municipalities.

SUMMARY OF THE INVENTION

To the end of conserving water while maintaining adequate sanitation in waste disposal, a water closet is provided comprising a toilet bowl incorporating a main flushable reservoir and an additional, relatively smaller, flushable reservoir or urinal adjacent and forward of the main reservoir. The two reservoirs employ separate flushing systems with independent water supply means. Independent siphon-type trap systems are employed for evacuating the reservoirs. A depressed rim transverse of the toilet bowl separates the two reservoirs. In a particular embodiment, namely, in the tank-type water closet typically used in residential applications, a water supply means is utilized which provides separate flushing but is contained within a conventional tank. The flushing system for the smaller reservoir is defined by a container in the tank which is filled through the holes in the container by water from the tank itself. The amount of flushing water can be determined by the height and size of the container and the size of the holes.

An object of this invention is to conserve supply water expended during the disposal of human wastes. The disposal of liquid water typically occurs three to five times as often as the disposal of solid waste. A particular advantage of the present invention is that considerably less water is utilized in the disposal of liquid wastes.

A further object of this invention is to reduce the volume of disposal sewerage through the reduction of the normal supply water requirement.

A still further object of the invention is to provide a flushable toilet bowl with reduced volume flushing.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention may be better understood by reference to the following detailed description of the preferred embodiments in conjunction with the accompanying drawings in which:

FIG. 1 is a side view in cutaway of a water closet according to the invention;

FIG. 2 is an isometric view in partial cutaway showing a tank-type water closet according to the invention; and

FIG. 3 is a top plan view of the toilet bowl.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

The present invention is illustrated with the particular reference to tank-type flushing systems as typically employed in residential applications. However, it should be understood that many aspects of the invention are also applicable to the valve-type flushing systems such as often employed in non-residential applications.

Referring particularly to FIG. 1, there is illustrated a water closet 10 with a forward reservoir 12 for collecting liquid water such as urine and an aft reservoir 13 for collecting solids. The two reservoirs 12 and 13 comprise the flushable portion of a toilet bowl 14. The forward compartment or reservoir 12 and the rear compartment or reservoir 13 are separated by a recessed rim 16 transverse of the toilet bowl 14. Each reservoir 12 and 13 is provided with respective siphoning throats 18 and 20. The ambient water level is established in the forward reservoir 12 by a first trap 22, and in the aft reservoir a second trap 24.

First and second siphoning throats 18 and 20 leading from the traps 18 and 20 merge at the base of the water closet 10 where waste is discharged through an outlet 44 into the sewer system.

Flushing water is supplied to the forward reservoir 12 by an inwardly disposed first flushing rim 26 around the forward reservoir 12. Orifices 28 serve to introduce flushing water into the forward reservoir 12 from a conduit 30 leading from a flushing water supply (not shown in FIG. 1). Similarly, a water conduit 32 serves to supply rim flushing through orifices 34 of a second flushing rim 36 around aft reservoir 13. In addition, a conduit 38 which shares a common supply 40 with conduit 32 provides flush water at the normally submersed level of the second compartment 13. A nozzle 42 at the end of conduit 38 is for directing a burst of flushing water through the trap 24, which leads to the second siphoning throat 20.

Flushing water may be supplied either through a metered valving arrangement as is common in non-residential installations or by a supply tank as is typical in residential installations.

In FIG. 2, a possible embodiment of a tank-type supply system is illustrated in conjunction with the bowl 14. A tank 46 is provided in which is established an ambient water level by a conventional float valve 47 or the like. A first drain valve plus 48 controls water passage through supply inlet 40 to the aft reservoir 13. Plug 48 is controlled by a first lever and handle 50 in a conventional manner.

Similarly, a second drain valve plug 52 is controlled by a second handle and lever 54 in a conventional manner for providing flush water from a reservoir through a second supply inlet 53 to conduit 30 leading to the forward reservoir 12.

Within the supply tank 46 is a secondary supply reservoir 56. The secondary reservoir 56 may be a hollow tube which is sealed to the base of the tank 46 about the valve plug 52, thereby establishing an isolated water column directly over the valve plug 52 when the supply reservoir 56 is filled. At or near the top of the secondary reservoir 56 there may be provided at least one opening 58 to permit overflow from the ambient level of water in tank 46 to fill the secondary reservoir 56. Since the ambient water level is normally above the openings 58, the filling mechanism for tank 46 also operates to fill the secondary reservoir 56 after evacuation thereof. This

eliminates any need for a separate filling mechanism for the secondary reservoir 56. In addition, the level of the opening 58 relative to the ambient level of supply water in tank 46 controls the amount of flush water utilized in the first reservoir flushing operation, since the supply water in tank 46 drains to the level of the openings 58 upon opening of valve plug 52, thereby activating the conventional float valve (not shown).

Referring now to FIG. 3, the relative location of the forward reservoir 12 and aft reservoir 13 of the toilet bowl 14 is illustrated. The partition or recessed rim 16, which is transverse of the toilet bowl 14, may be located either forwardly or aftwardly, as design considerations may dictate. Furthermore, rim flush may be provided along the outer rim of the toilet bowl 14 above the rim 16 to assure that the top of the partition is adequately cleansed. As is illustrated in FIG. 3, the area or volume of standing water in the forward compartment 12 may be considerably less than in the rear compartment 13. Furthermore, the overall size of the water closet is reduced relative to the size of a conventional water closet, which should also reduce the demands for expulsion of flushing water.

While the invention has been described with reference to specific embodiments, it should be understood that the invention is not to be limited except as indicated by the appended claims.

I claim:

1. A siphoning water closet comprising: a toilet bowl having a pair of opposed sides and an inner, substantially straight partition spanning the distance between and coupled to the sides at least adjacent to the widest part of the bowl to define a first reservoir for receiving liquid wastes and a second reservoir for receiving solid wastes;

first means coupled with said first reservoir and including a first trap for placing said first reservoir in fluid communication with a sewer line;

second means coupled with said second reservoir and including a second trap for placing said second reservoir in fluid communication with said sewer line;

third means coupled with said first reservoir for flushing wastes therefrom; and

fourth means coupled with said second reservoir for flushing wastes therefrom independently of the flushing of wastes from said first reservoir, said fourth means including a supply tank having a bottom, said third means including means in the tank and communicating therewith for forming a column of water extending upwardly from said bottom, the water in said column being used to flush the wastes from said first reservoir, wherein said third and fourth means include separate supplies of flush water for said first and second reservoirs, respectively.

2. A water closet according to claim 1 wherein said supply tank has first and second outlet valves in the bottom thereof, there being a valve for each reservoir, respectively, said third means including a supply tube extending upwardly from the bottom of said supply tank in surrounding relationship to the valve corresponding to said first reservoir, so as to provide a separate supply of flush water for said first reservoir, said supply tube having at least one opening in its walls a preselected distance below the ambient level of water in said supply tank for refilling said tube with water from said supply tank after flush water previously contained in said tube has been supplied to said first reservoir.

3. A water closet according to claim 1 wherein said third means and fourth means include first and second flushing rims circumscribing said aft and fore reservoirs.

4. Apparatus for storing and dispensing flush water for a water closet having a pair of flushing conduits comprising:

a water supply tank having a bottom provided with a pair of valves therein, there being a valve for each flushing conduit, respectively, of said water closet;

an elongated hollow member in said tank for receiving and storing a column of flush water to be dispensed through one of said conduits, said member extending upwardly from said bottom to above the ambient water level in said tank and having a lower end surrounding one of the valves, said member having at least one inlet opening below the upper end of the member for filling said member with water from said tank to present a column of water extending from the lower end of the member to said ambient water level, said member being refillable after the column of water previously contained in said member has been dispensed through said one conduit;

first means coupled with said one of the valves for opening the same to permit the column of water in the member to be dispensed through said one conduit; and

second means independently of the first means for opening the second valve.

* * * * *

Exhibit H

PCT Publication No. 92/19824

PCT WORLD INTELLECTUAL PROPERTY ORGANIZATION
International Bureau

INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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(81) Designated States: AT, AT (European patent), AU, BE (European patent), BG, BR, CA, CH, CH (European patent), DE, DE (European patent), DK, DK (European patent), ES, ES (European patent), FI, FR (European patent), GB, GB (European patent), GR (European patent), HU, IT (European patent), JP, KP, KR, LU, LU (European patent), MC (European patent), NL, NL (European patent), NO, PL, RO, RU, SD, SE, SE (European patent), US.

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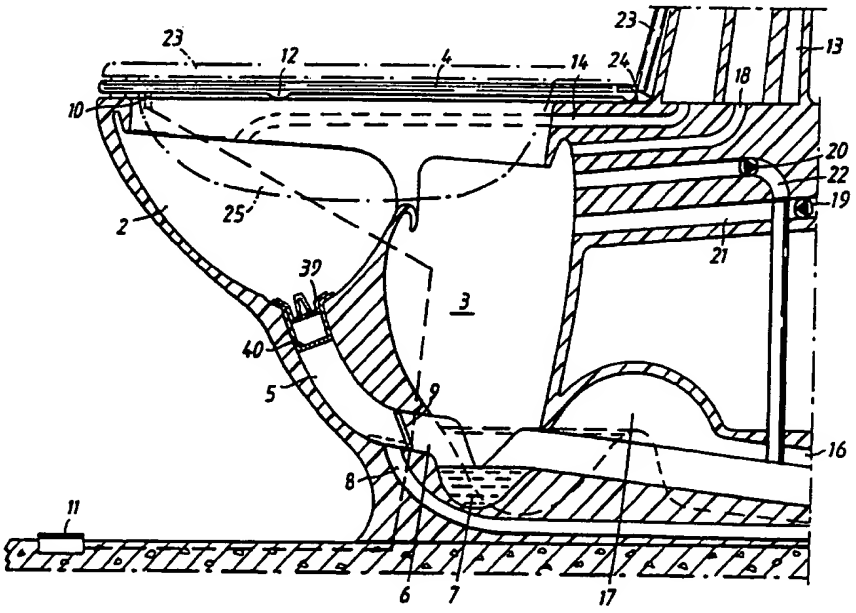
(54) Title: TOILET- AND HYGIENE EQUIPMENT



(57) Abstract

A toilet- and hygiene equipment comprises individual collection bowls (2, 3) for urine and feces, respectively. These collection bowls are disposed under a common seat (4) so that a person after having moved himself may use these collection bowls one after the other. In order to permit saving of urine the collection bowl (2) for urine has an outlet conduit (5) of its own which is separate from the outlet conduit from the collection bowl for feces and is connectable to e.g. a transport vessel. It is preferred that the collection bowl (2) for urine is in communication with two outlet conduits (6, 8) of which at least one may be shut-off by means of a shut-off device (9), so that urine may reach a storing vessel, in one position of the shut-off device, whereas urine residuals and a small amount of flushing water may reach a drain or the like, in the other position of the shut-off device. The shut-off device may be controlled by means of special transmitters (4, 11) that may be activated by the person who is using the toilet.

Toilet- and hygiene equipment

This invention relates to a toilet- and hygiene equipment.

The object of the invention has been to provide an equipment which meets the human toilet- and/or hygiene demands in an inobjectable manner with respect to the environmental requirements.

More specifically, the invention has for its object to decrease the demand on water, paper and the like in connection with toilet visits, at the same time as the wastes may be utilized for fertilizing, composting and the like.

To realize the above and other objects the invention has got the characterizing features as set forth in the claims.

The invention will be disclosed in more details below with reference to the accompanying drawings.

Figure 1 is a longitudinal section through a first equipment according to the invention, picked as an example;

Figure 2 i a longitudinal section through a second equipment according to the invention, picked as an example;

Figure 3 shows the equipment of figure 2, seen from above, but with the lid and a support ring removed;

Figure 4 shows the equipment in figure 2 in a frontal view.

As shown in the drawings the equipment in the emobdiment according to figure 1 consists of a slightly modified toilet bowl, which has been generally denoted 1 in the drawing. As contrasted to conventional toilet bowls, the toilet bowl according to the invention comprises two individual collecting bowls 2 and 3, respectively, disposed one behind the other, from which the foremost bowl 2 is adapted for collection of urine whereas the rearmost one 3 is adapted for collection of feces.

According to the invention the toilet bowl is designed in such a manner that a person sitting on the support ring 4 in a first, foremost position may utilize the foremost portion of the toilet bowl, i.e. uecesrinate, and in a second position, more rearwardly of the bowl, may utilize the rearmost portion thereof, wherein fececeses are collected. Thus, it is possible to bring about the desired separation of urine and feces by a simple sliding movement.

To permit saving of urine the urine collecting bowl 2 in this first embodiment is provided with an outlet conduit 5 of its own, which, via a water trap may pass to an own storing tank (not shown) of any desired type for storing of a urine/-flushing water mixture so that the urine/flushing water mixture may be stored and may be made useful.

In the embodiment in figure 5, the urine collecting bowl 2 similarly has its outlet into an otlet conduit 5 of its own, which conduit in turn is connected on one hand to a first outlet conduit 6 that, via a water trap 7, can lead to either a municipal sewer conduit or be led away to e.g. a garden plant, and, on the other hand, a second outlet conduit 8, that leads to a collecting vessel (not shown) which preferably has the shape of a transport vessel that may be picked up by an urine user to be utilized as a fertilizer, for instance.

In this embodiment a shut-off device 9 is provided between the conduits 6 and 8, and this device is adapted to permit that the flow of urine or urine with flush water, respectively, may be passed into different outlet conduits. This shut-off device, which of course may take any desired shape, is shown in the drawing as having the shape of a flap which is shiftable from an operative position, shown in full lines, to an inoperative position, shown in dashed lines. According to the invention this shifting is prèferably brought about after an impulse from two different transmitters 10 and 11, respectively. Thereby, the first mentioned transmitter is preferably arranged at the uppermost portion of the toilet bowl, adjacent the foremost edge thereof, whereas the second one is disposed at the floor, in front of the toilet bowl and at a distance that corresponds to the distance between a man, who is urinating, and the collecting bowl 2 wherein the urine is intended to be collected.

Preferably, the support ring 4 is arranged tiltable, e.g. in that it rests on downwardly protruding, rounded fulcrums 12, disposed between the foremost and rearmost portions of the support ring, but normally the support ring by means of a spring biased member is held in such a position that the t-ransmitter 10 is maintained inactivated. However, as one sits down on the support ring and rests on the foremost portion thereof, the support ring will tilt slightly counter clockwise

in relation to the fulcrums 12. Thereby, the transmitter 10, which may consist of a microswitch or the like, is activated and the transmitter transmits an impulse to a relay, a magnet valve or the like which moves the shut-off member to its inactive, dashed position in which it permits free communication between the collecting bowl 2 and the outlet conduit 8. Therefore, the urine will be led directly to the above mentioned transport vessel. The condition will be the same if one stands on the floor in a manner to activate the transmitter 11.

When one slides rearwardly on the support ring and the centre of gravity is consequently displaced to the other side of the fulcrums 12, the support ring 4 tilts up clock wise, whereby the shut-off means 9 returns to its active position, closing the conduit 8. Therefore, in this position the shut-off means prevents communication between the collecting bowl 2 and the outlet conduit 8.

It will be realized that it is possible, by the described arrangement, to collect nearly pure urine in a storing vessel or the like, which urine keeps almost entirely odor free for a long period of time, because it does not come into contact with the bacteria of the water and/or the air.

By permitting a restricted amount of water from the water reservoir 13 of the toilet (such as e.g. about 2 dl per flushing operation) to reach the collecting bowl 2 via a conduit 14 it is achieved that this very restricted flushing water amount and residual urine in the bowl 2 and the conduit 5 reach the conduit 6 and thus the above mentioned outlet or withdrawal point. In this way the bowl 2 is always maintained clean, at the same time as the amount of flushing water is held at a minimum.

Since one is now straigt above the bowl 3 the feces will go down thereinto, and by means of an essentially conventional flushing device these feces along with flushing water will leave through a conduit 16, provided with a water trap 17. The flushing water conduit has been denoted 18 in figure 2. Fans 19, 20 and conduits 21, 22, respectively, may be provided to vent off unpleasant odors and blow in fresh air.

The just described equipment may be varied in many different ways as to its individual details within the scope of

the appendant claims.

Thus, it may be conceived, for instance, to arrange the collecting bowls 2 and 3 one after the other sidewardly rather than one behind the other, in which case the bowl and the support ring have to be adapted therefore. It would also, of course, be possible to provide a conveyor for the feces to a special collection site, and it would thereby be possible, as with the urine, to provide one conduit that leads to this collection site, and another conduit, which passes the flushing water and remaining residues of feces to a conventional drainage. As with the urine collection bowl 2, which has a removable grid 39 and, if desired, also a fixed grid 40, it would be possible to provide such grids also for the collection bowl for feces. Such grids have mainly the purpose of catching objects that are unintentionally dropped into the toilet. The shut-off means 9, like a possible shut-off device for feces, may of course be designed in any suitable manner, and the transmitters and the positioning thereof may be varied in a plurality of ways.

Claims

1. A toilet- and hygiene equipment, comprising individual collecting bowls (2, 3) for urine and feces, disposed under a common seat (4), one after the other, so that a person sitting on the seat by movement may reach either one of the bowls, **characterized in** that each one of the collection bowls (2,3) has individual outlet conduits (5, 5,6,7) of its own, from which the conduit passing from the collection bowl (2) for urine is connectable to a storing vessel or the like for an urine/flushing water mixture, whereas the conduit (5, 6, 7) from the collection bowl for feces is adapted in conventional manner to be connected to a fixed drainage (figure 1).

2. A toilet- and hygiene equipment according to claim 1, **characterized in** that the collection bowl (2) for urine is connected on one hand to a first conduit (8) that leads to a transport vessel, and on the other hand to a second conduit (6) that passes to a drain, and in that at least the conduit (8) to the transport vessel is closable by means of a shut-off device (9) that is controlable at will.

3. A toilet- and hygiene equipment according to claim 1 or claim 2, **characterized in** that a flushing water conduit (14) with a restricted water flow is connected to the collection bowl for urine.

4. A toilet- and hygiene equipment as claimed in one of claims 1 - 3, **characterized in** that a transmitter (11), disposed on the floor, is adapted to become operative as it is subjected to the weight of a person standing at a predetermined distance in front of the toilet, whereas the second transmitter (12) is adapted to be made operative by a person sitting on one portion of the toilet seat, preferably the foremost portion thereof.

5. A toilet- and hygiene equipment as claimed in one of claims 2 - 4, **characterized in** that the toilet seat (5) is adapted to be tiltable, e.g. in that it rests on fulcrum means (12), disposed between the front and rear edges of the seat and in that it is normally held in a position slightly tilted upwardly by means of spring biased member.

AMENDED CLAIMS

[received by the International Bureau on 25 September 1992 (25.09.92); original claims 1-5 replaced by amended claims 1-5 (1 page)]

1. A toilet- and hygiene equipment, comprising individual collecting bowls (2, 3) for urine and feces, disposed under a common seat (4), one after the other, so that a person sitting on the seat by movement may reach either one of the bowls, **characterized in** that each one of the collection bowls (2,3) has individual outlet conduits (5,6, 16) of its own, from which the conduit (5,6) passing from the collection bowl (2) for urine is connected on one hand to a first conduit (8) that leads to a storing container, a transport vessel or the like, and on the other hand to a second conduit (5,6) that passes to a drain, whereas the conduit (16) from the collection bowl for feces is adapted in conventional manner to be connected to a fixed drainage, preferably through a water trap (17), and in that at least the conduit (8) to the transport vessel is closable by means of a shut-off device (9) that is controllable at will.

2. A toilet- and hygiene equipment as claimed in claim 1, **characterized in** that the second conduit (5, 6) that passes to a drain, is provided with a water trap (7).

3. A toilet- and hygiene equipment according to claim 1, **characterized in** that a flushing water conduit (14) with a restricted water flow is connected to the collection bowl (2) for urine.

4. A toilet- and hygiene equipment as claimed in one of claims 1 - 3, **characterized in** that a transmitter (11), disposed on the floor, is adapted to become operative as it is subjected to the weight of a person standing at a predetermined distance in front of the toilet, whereas the second transmitter (12) is adapted to be made operative by a person sitting on one portion of the toilet seat, preferably the foremost portion thereof.

5. A toilet- and hygiene equipment as claimed in one of claims 2 - 4, **charact rized in** that the toilet seat (5) is adapted to be tiltable, e.g. in that it rests on fulcrum means (12), disposed between the front and rear edges of the seat and in that it is normally held in a position slightly tilted upwardly by means of spring biased member.

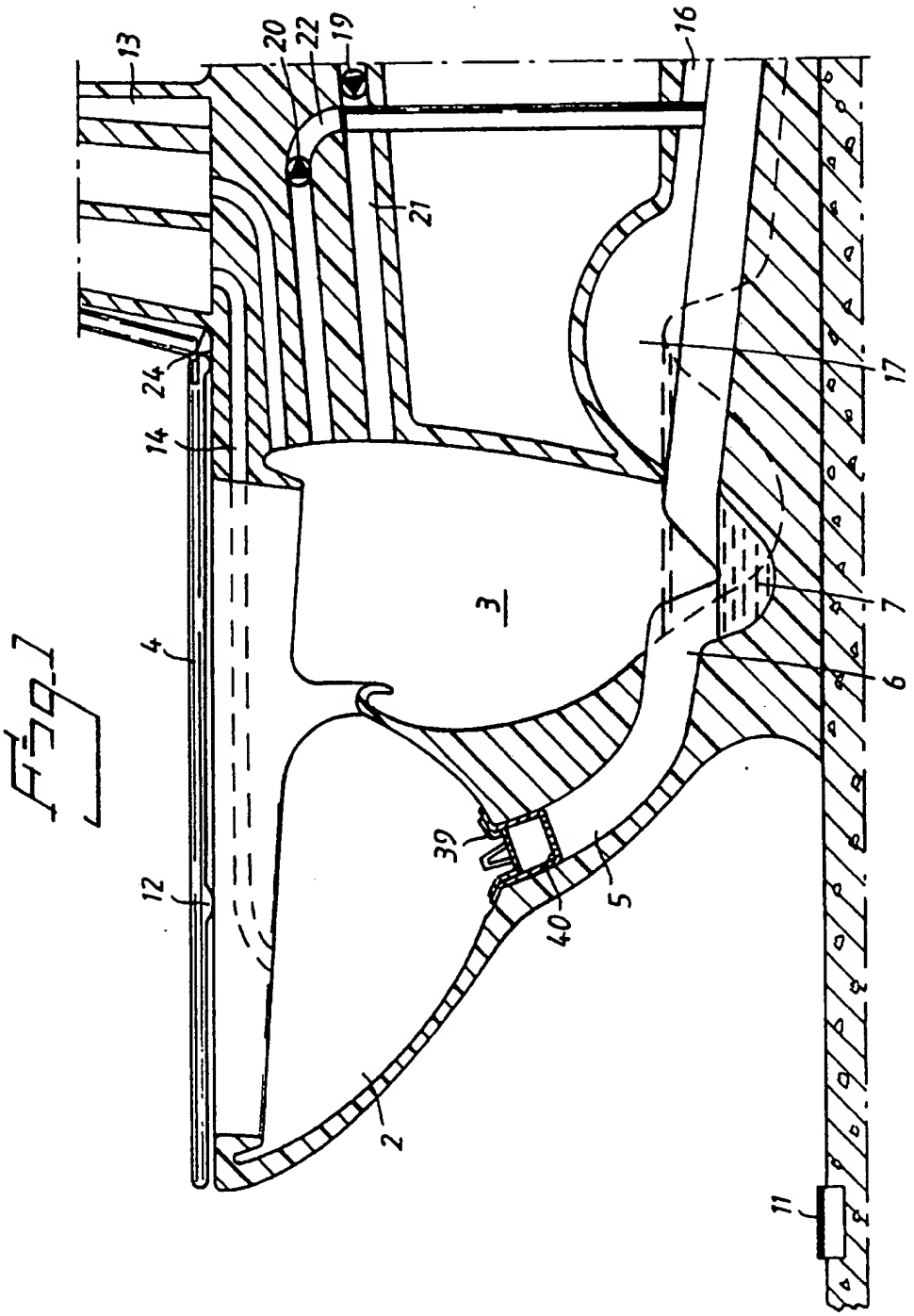


Fig 1

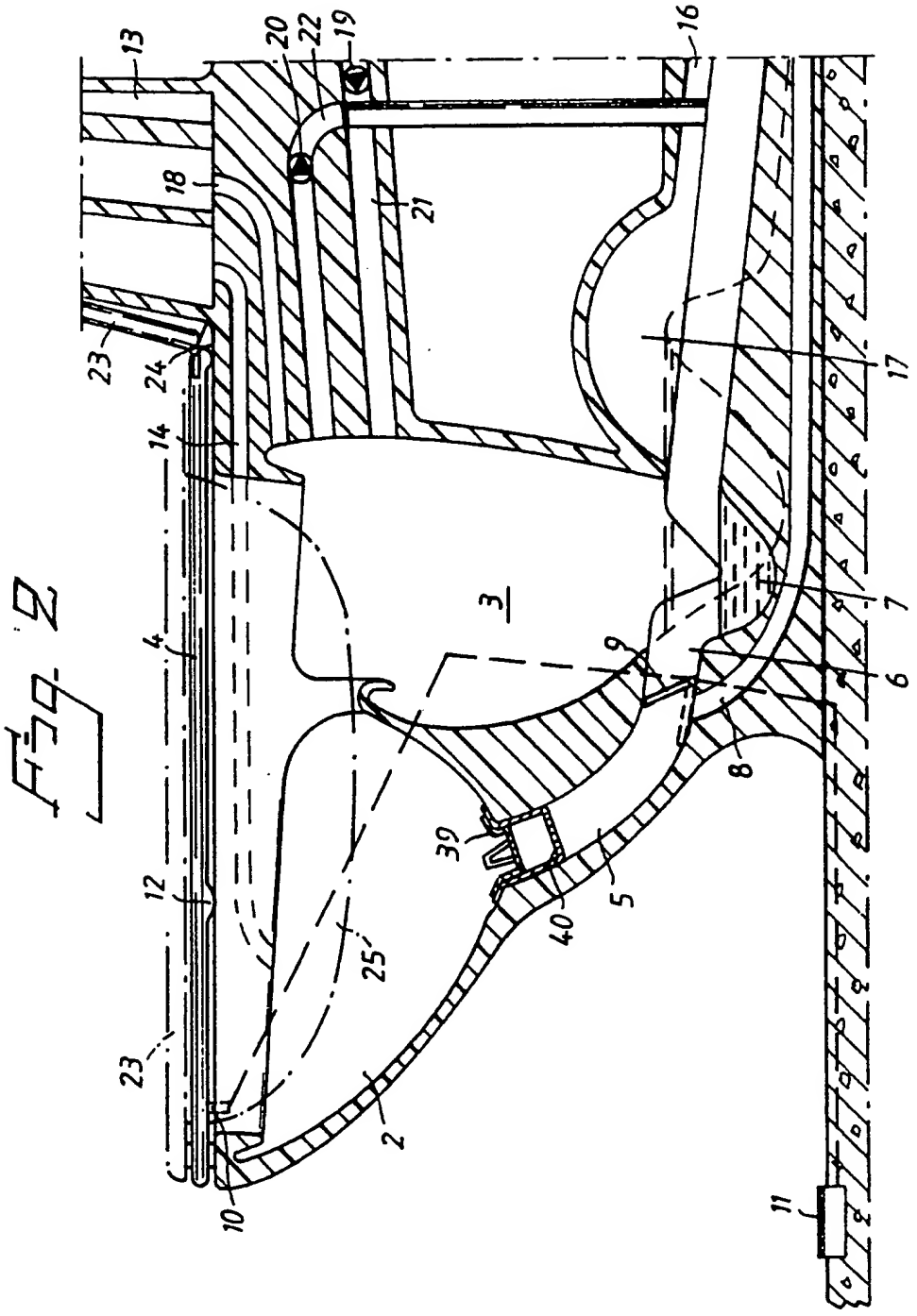


Fig. 2

Fig. 3

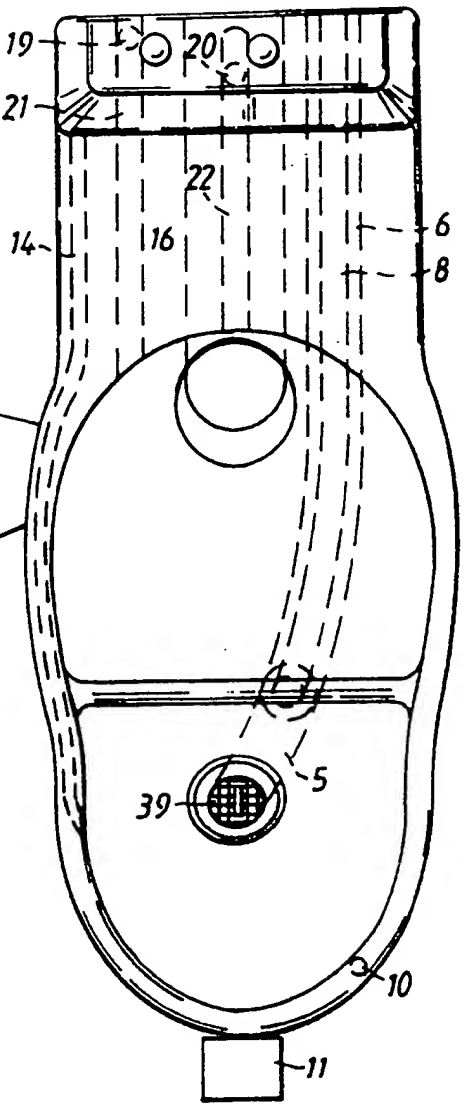
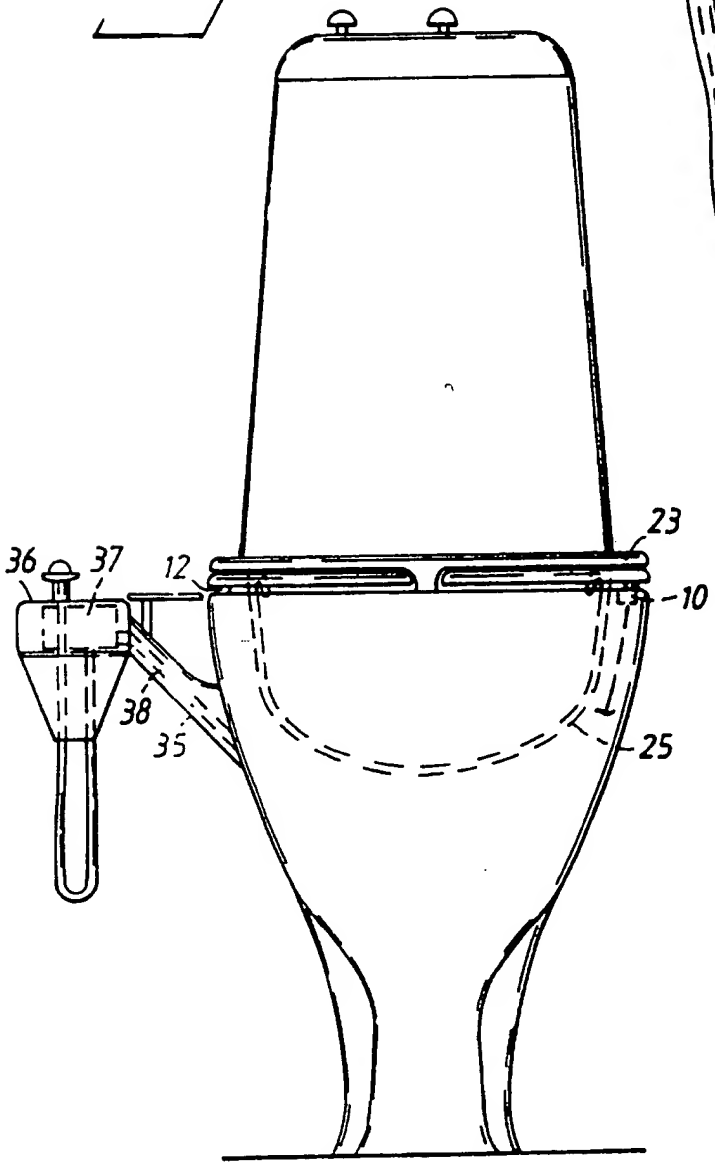


Fig. 4



AMENDMENT AFTER FINAL
EXPEDITED PROCEDURE
ART UNIT 3751

PATENT
VOSS1170

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Ulrich Braun	Art Unit:	3751
Serial No.:	09/890,113	Examiner:	R. Fetsuga
Filed:	January 7, 2002		
Title:	METHOD AND DEVICE FOR SEPARATING AND DISPOSING OF FAECES AND URINE IN URINE SEPARATION TOILETS		

Mail Stop AF
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

PETITION FOR EXTENSION OF TIME

Sir:

This is a request under the provisions of 37 C.F.R. § 1.136(a) to extend the period for responding to the Final Office Action mailed June 12, 2003.

The requested extension is for three (3) months, extending the period for response from September 12, 2003 to December 12, 2003.

CERTIFICATION UNDER 37 CFR §1.8

I hereby certify that the documents referred to as enclosed herein are being deposited with the United States Postal Service as first class mail on December 12, 2003, in an envelope addressed to: Mail Stop AF, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

Karen LePari

Gray Cary\GT\6378190.1
105032-4

Enclosed is Check No. 549752 in the total amount of $640.00 for the three month extension of time fee ($475.00) and the Notice of Appeal fee ($165.00). The Commissioner is hereby authorized to charge Deposit Account No. 50-1355 for any other fees or credits believed to be due. A copy of the Transmittal Sheet is enclosed.

Respectfully submitted,

Date: December 12, 2003

Emanuel J. Vacchiano, J.D., Ph.D.
Reg. No. 43,964
Telephone: (858) 638-6754
Facsimile: (858) 677-1465

GRAY CARY WARE & FREIDENRICH LLP
4365 Executive Drive, Suite 1100
San Diego, CA 92121-2133
USPTO Customer Number 28213

NOTICE OF APPEAL FROM THE EXAMINER TO THE BOARD OF PATENT APPEALS AND INTERFERENCES	Attorney Docket No.: VOSS1170
In re Application of: Ulrich Braun	
Application No: 09/890,113	Filed: January 7, 2000
For: METHODS AND DEVICE FOR SEPARATING AND DISPOSING OF FAECES AND URINE IN URINE SEPARATION TOILETS	
Group Art Unit: 3751	Examiner: R. Fetsuga

Applicants hereby appeal to the Board of Appeals from the decision dated June 12, 2003 of the Examiner rejecting claims 1-20.

1.	X	Appeal Fee (37 C.F.R. 1.17(b))		
			other than small entity	$330.00
		X	**small entity**	**$165.00**

2.	X	A petition and fee for an extension of time for reply to the rejection is attached.						
X	Extension Fee (37 C.F.R. 1.17(a)							
		Other than small entity						
			$110.00		$420.00		$950.00	$1,480.00
	X	**Small entity**						
			$55.00		$210.00	X	$475.00	$740.00

3.	X	Enclosed is Check No. 549752 in the total amount of $640.00 ($165.00; to file the Notice of Appeal and $475.00 for the Three (3) Month Extension of Time fee). The Commissioner may charge any additional fees associated with the filing submitted herewith, or credit any overpayment, to Deposit Account No. 50-1355.

December 12, 2003
Date

Emanuel J. Vacchiano, J.D., Ph.D.
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GRAY CARY WARE & FREIDENRICH LLP
4365 Executive Drive, Suite 1100
San Diego, California 92121-2133
USPTO Customer Number: 28213

CERTIFICATION UNDER 37 CFR 1.8

I hereby certify that the documents referred to as enclosed herein are being deposited with the United States Postal Service as first class mail on this date, **December 12, 2003,** addressed to: Mail Stop AF, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

Karen LePari
(Name of person mailing paper)

Karen LePari December 12, 2003
Signature Date

AMENDMENT AFTER FINAL
EXPEDITED PROCEDURE
ART UNIT 1642

PATENT
VOSS1170

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Ulrich Braun	Art Unit:	3751
Serial No.:	09/890,113	Examiner:	R. Fetsuga
Filed:	January 7, 2002		
Title:	METHOD AND DEVICE FOR SEPARATING AND DISPOSING OF FAECES AND URINE IN URINE SEPARATION TOILETS		

Mail Stop After Final
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

LETTER TO DRAFTSPERSON UNDER MPEP 608.02(r)

Sir:

Enclosed herewith are two (2) sheets of drawings (FIGS. 1, 2A-2D, and 3A-3B) for the above-identified application showing changes to be made in red permanent ink. Additionally, enclosed herewith are two (2) sheets of drawings (FIGS. 1, 2A-2D, and 3A-3B) for the above-identified application after the changes are implemented. The changes were made in response to objections to the drawings set forth in the Office Action dated June 12, 2003.

CERTIFICATION UNDER 37 CFR §1.8

I hereby certify that the documents referred to as enclosed herein are being deposited with the United States Postal Service as first class mail on December 12, 2003, in an envelope addressed to: Mail Stop AF, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

Karen LePari

Karen LePari

Gray Cary\GT\6378279.1
105032-4

In figure 1 and figures 2A-2D, cross hatchings were added. In Figure 1 and Figures 2A-2D the term "Schnitt" was replaced with figure numbers e.g., "FIG 2A." In Figure 1 and Figures 2A-2B element numbers were changed. In Figure 3, the inset was relabeled as FIG 3B and the large drawing was relabeled as "FIG 3A."

Respectfully submitted,

Date: December 12, 2003

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Enclosure: Exhibits A and B

Exhibit A

Replacement Sheets 1-2

APPLICANT(S): Ulrich Braun
TITLE: METHOD AND DEVICE FOR SEPARATING AND DISPOSING OF FAECES AND URINE IN URINE SEPARATION TOILETS
Application No.: 09/890,113 File Date: January 7, 2002
Docket No.: VOSS1170

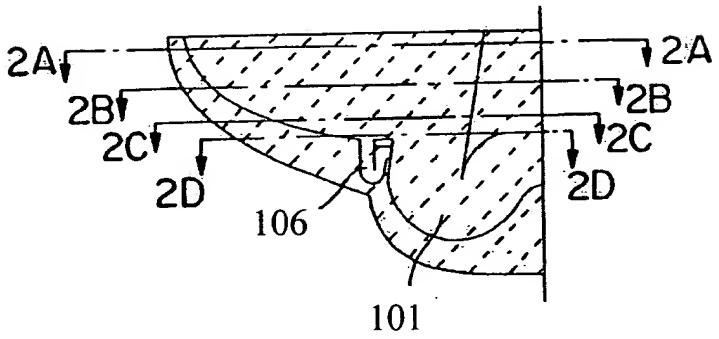


FIG. 1

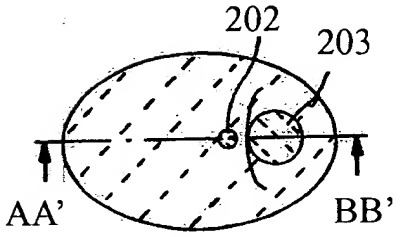


FIG. 2A

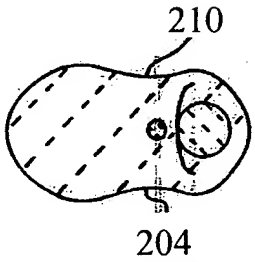


FIG. 2B

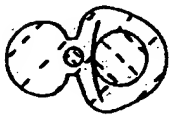


FIG. 2C

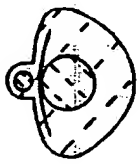


FIG. 2D

APPLICANT(S): Ulrich Braun.
TITLE: METHOD AND DEVICE FOR SEPARATING AND DISPOSING OF FAECES AND URINE IN URINE SEPARATION TOILETS
Application No.: 09/890,113 File Date: January 7, 2002
Docket No.: VOSS1170

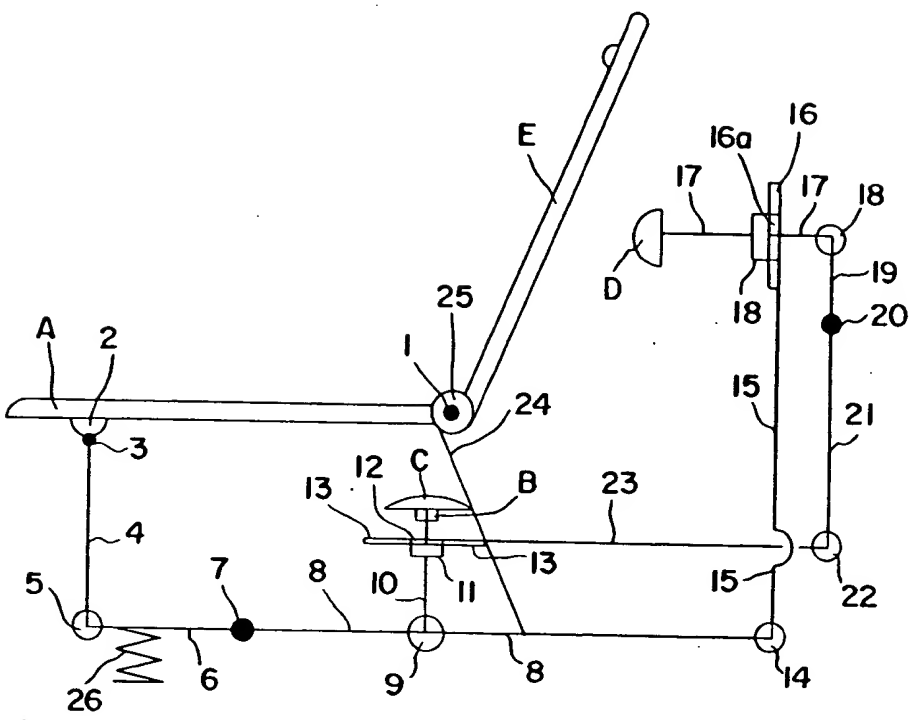


FIG. 3A

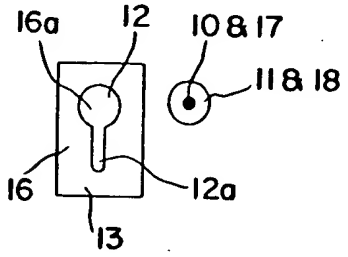


FIG. 3B

Exhibit B

Marked-Up Drawings

~~Fig. 3~~

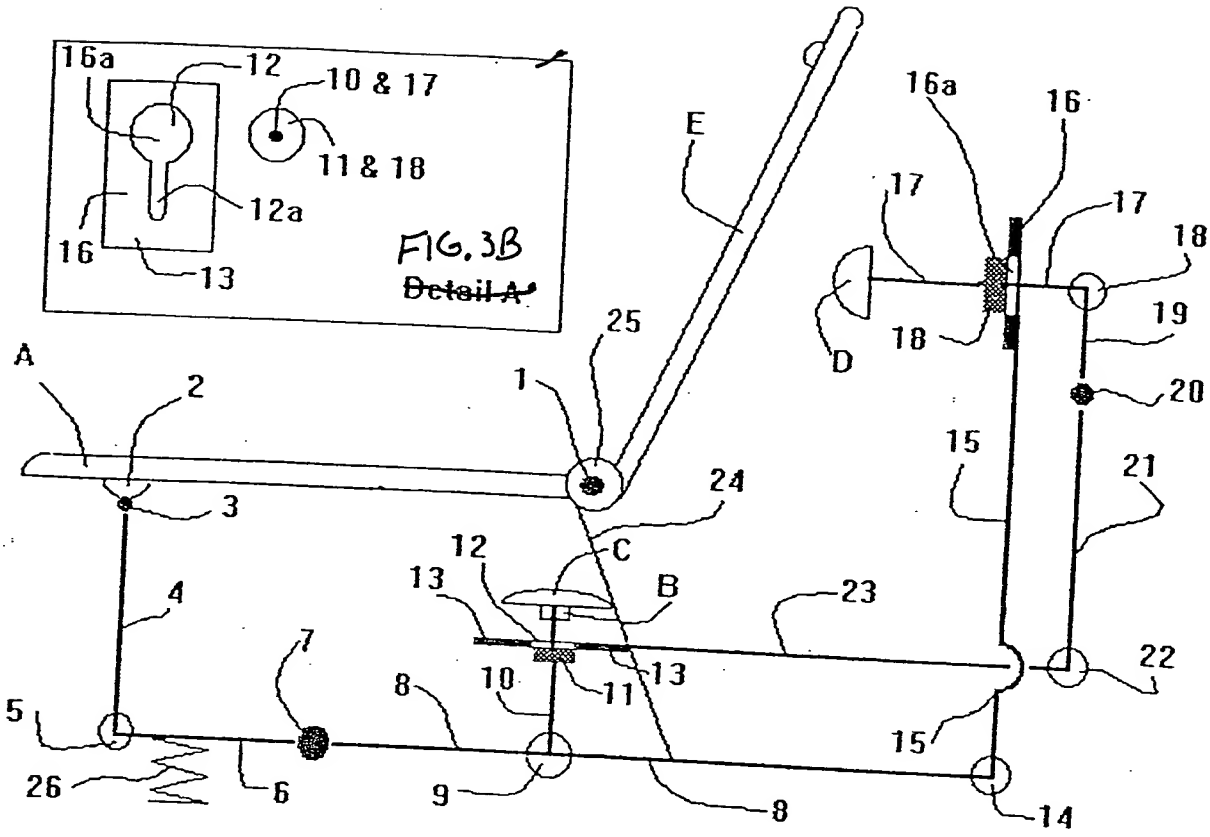


FIG. 3B

FIG. 3A

~~Fig. 2~~

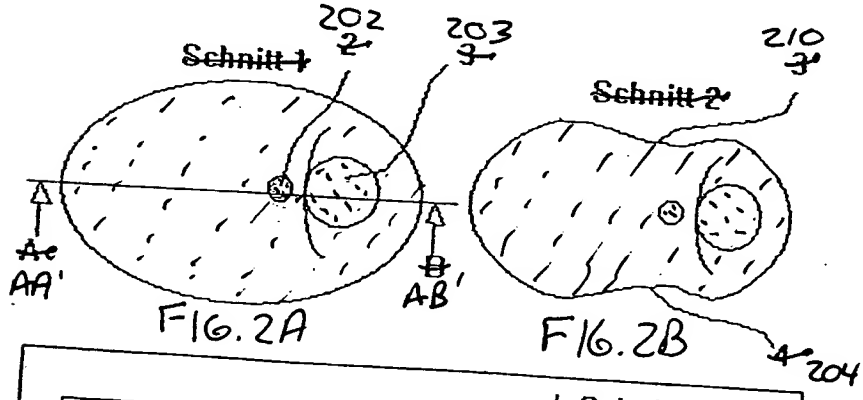
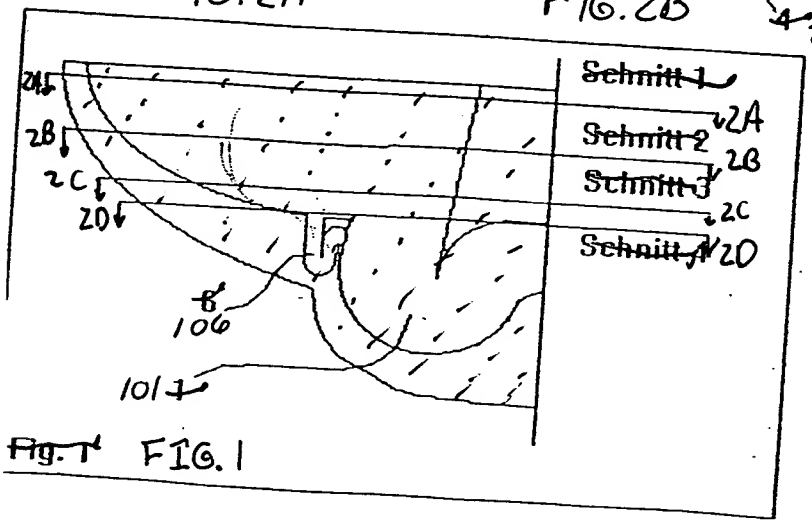


FIG. 2A

FIG. 2B

FIG. 2C



~~Fig. 1~~ FIG. 1

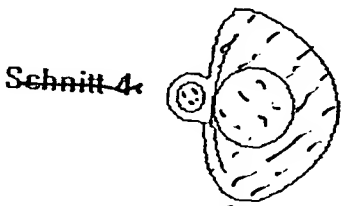


FIG. 2D